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No. 1.

PROCEEDINGS.

EVENING MEETING, MONDAY, 19th JULY, 1926:—The President (Dr. E. O. Marks) occupied the chair. Reports on the botany of the excursions to Brookfield and Woodridge were given by Mr. C. T. White, who tabled specimens of the more interesting plants. Mr. H. Tryon gave notes on a number of entomological, zoological and botanical exhibits, collected by him at Woodridge. Mr. D. A. Herbert spoke on some Western Australian wild flowers forwarded by Mr. Berthould, of Hamel, to Mrs. Herbert Curtis, and sent by her for exhibition at the meeting. A case of butterflies was exhibited by Mr. Franzen, illustrating a remarkable aberration in the common skipper (*Trapezites eliena*). See p. 10. Mr. J. E. Young exhibited a specimen of a climbing Liliaceous plant (*Eustrephus*) showing well developed root-tubers, also the seed capsule of *Eucalyptus miniata* and other material.

EVENING MEETING, MONDAY, AUGUST, 1926: The President (Dr. E. O. Marks) occupied the chair. The evening was more especially devoted to a lecture by Mr. J. E. Young on the work of the Wilkins' Expedition to Queensland. Mr. Young, aided by a series of interesting lantern slides, spoke of the work of the expedition, firstly in the South-western portion of the State, then in the Cape York Peninsula, and later in parts of the Central West.

WILD FLOWER SHOW, SATURDAY, 18th SEPTEMBER, 1926:—This exhibition has now become a popular annual event, as was shown by the fact that several hundred people visited the show during the afternoon and evening. The quality of the displays, despite the dry season just passed through, bore comparison with those of pre-

vious years. As it was only possible this year to secure a comparatively small hall, the committee were reluctantly compelled to omit the general natural history exhibits and devote the whole of the available space to wild flowers and wild flower photographs. Flowers were received from Mrs. S. and Mr. D. Curtis (Albert River), Mrs. H. Curtis and Mr. C. Geissmann (Tambourine Mountain), Miss M. Birt (Molendinar), Mr. Thos. Welsby (Stradbroke Island), Mr. J. E. Young (Brisbane), Mrs. C. A. Messmer (Sydney), Misses O'Connor and Heeschen. Mr. J. C. Brunnich, Mrs. C. T. White, and from the Head Teachers of the State Schools at Russell Island, Coochin Creek, Caloundra, Thulimbah, Stanthorpe, Mullet Creek, and Elimbah. A beautiful series of coloured photographs of Australian Wild Flowers, tabled by Mr. R. L. Higgins, was much admired. An album of photographs of wild flowers, taken on the excursion to Cowan Cowan (Moreton Island), was forwarded by Mrs. Herbert Curtis. Mr. E. W. Bick (Botanic Gardens), lent specimen native plants for decorative purposes.

SPECIAL MEETING, TUESDAY, 28th SEPTEMBER, 1926:—The President (Dr. E. O. Marks) occupied the chair. The evening was devoted to a lecturette by Mr. A. H. Chisholm (Past President) on the activities of members of the Naturalists' Club of New South Wales, and similar bodies in the mother State. In the course of his remarks Mr. Chisholm laid special stress on the need for a strict watch on National Parks and Reserves.

EVENING MEETING, MONDAY, 18th OCTOBER, 1926:—The President (Dr. E. O. Marks) occupied the chair. Mr. E. W. Bick, who had been appointed the Club's representative at the Eighteenth Meeting of the Australasian Association for the Advancement of Science, held at Perth in August, gave a report on the congress. He also gave a few general notes, and exhibited a number of photographs and a series of mounted botanical specimens, illustrative of the flora of different places visited in Western Australia. A report of the botany of the excursion to Elimbah was given by Mr. C. T. White. Dr. E. O. Marks spoke on the geological features of the Elimbah-Glass House Mountains district. A report on the botany of the excursion to Nudjee was given by Mr. D. A. Herbert. Fruits of a "Native Pomegranate" (*Capparis*) and flowers of an Indian Orchid (*Cymbidium Lowii*) were tabled by Mr. Young.

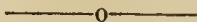
EVENING MEETING, MONDAY, 15th NOVEMBER, 1926:—A lecture on the Great Barrier Reef was given by Professor H. C. Richards; the chair being taken by Dr. E. O. Marks.

Professor Richards said the fact that there was so extensive and interesting a coral formation off the coast of Queensland had not been so widely known, as it deserved to be. Furthermore, it was somewhat of a reproach to Australia that until quite recently the investigation of the reef had been undertaken largely by scientists from overseas. The appointment of the Barrier Reef committee, consisting of Australian scientists, and largely financed with Australian money, had been a step towards removing that reproach. He touched upon the early discoveries of the reef, mentioning particularly the names of Captain James Cook, and Captain Bligh, of H.M.S. *Bounty* fame. In referring to the physical structure of the reef, he spoke of the need for an effective survey of the coast, with a view to minimising the frequent mishaps to shipping which had been taking place for years past. He also explained how the investigations had been approached from a scientific standpoint. Borings, he said, were started in May last on Michaelmas Reef, 22 miles north-east of Cairns, that spot being in a central position between the northern and southern ends of the reef.

Professor Richards exhibited a series of lantern slides, illustrating various descriptions of coral reefs, and other views of the coastal islands. Some of the photographs from which these were reproduced had been taken by Mr. E. Saville Kent, when Inspector of Fisheries to the Queensland Government, and others by the late Mr. Charles Hedley. A picture was shown of Murray Island, on which Mr. Alfred Maer had carried out ecological studies into the different forms of marine life. Professor Richards stated that an ecological study was to be commenced next year under the auspices of the Great Barrier Reef Committee on Low Islands, near Port Douglas. Mr. Potts, a marine biologist, from England, was coming out to take charge of the investigations, accompanied by two or three other scientists, and they would be assisted by some others on behalf of the Great Barrier Reef Committee, their work probably occupying 12 months. A commencement would be made in about July next.

A vote of thanks to Professor Richards was carried on the motion of Dr. A. Jeffries Turner, seconded by Mr F. O. Nixon.

Exhibit.—Mr. Conrad Dornbusch, of Warwick, forwarded for exhibit a capsule of the Crow's Ash (*Flin-dersia australis*), showing four instead of the usual five valves.



LAKES AND MIDDENS ON STRADBROKE ISLAND.

(By J. E. Young.)

The Field Naturalists' Easter camp-out at the "One Mile," on Stradbroke Island, would hardly have been complete without a visit to the lakes, and accordingly one fine morning seventeen of our total number (24), and including both sexes, set out for the big day of the trip.

The first lake, sometimes known as the brown lake, and to the natives as "Boomera," was reached in a couple of miles. Appropriately about three-quarters of a mile long and in places over a quarter of a mile wide, it has shallow margins, with a fringe of reeds, most pronounced at the southern end, and otherwise with a fair depth of water throughout, and closely wooded to the margin, except to the south, from whence we got a fine view.

Passing on, we noted, and of course, stayed to photograph a nest of English bees; it could hardly be called a hive, though there were three combs suspended from a partly fallen cypress, and a considerable number of active bees.

On our way birds of various kinds were seen: Leatherheads, honey-eaters of various species, bar-shouldered doves, a bird which may have been the Olive Whistler,* for it did not seem to belong to the com-

*This is rather an unlikely record, the Olive Whistler, so far as is known in Queensland, being confined to the Beech-forests of the Lamington National Park. Mr. Young's bird is the one probably which has been puzzling local ornithologists for some time. Until specimens have been captured, the correct identification of the bird will be in doubt.
—Ed.

moner varieties, and numbers of others, including small flocks of blue-mountain and greenie parrots, the blossoms being somewhat scarce. They will, however, be more numerous soon.

Some of the party took toll of the Geebung (Per-soonia) which are in full fruit, and also a few stray berries of the Midgin bush (*Myrtus tenuifolia*, var *latifolia*). This bush in places covers many acres, and being very prolific, in past days added much to the natives' larder.

Our track brings us, ere lunch, by open flats and thickly-wooded hills, to the Blue Lake, known to the natives as "Kaboora."

Clear and bluish in colour, and reputed to be very deep,—it is certainly far from shallow—surrounded by thickly forested clad hills, it has no level banks, for the hillsides run straight down into the water, and afford reeds but little opportunity to grow. It is, however, margined with ferns, both climbing and otherwise, and sphagnum moss in places. Shaped somewhat like the letter L broadened out, and withal not having the extent of Boomera, it is one of the most beautiful of lakes, a gem only seen by the favoured few, or by those hardy enough for a good day's walk.

The presence of fish seems to be indicated by a pair of hovering eagles, and a pied cormorant.

Whilst admiring the scene one is reminded that some years ago the idea was mooted to utilise the waters of the Stradbroke Lakes as a supply for Brisbane. Surveys and reports were made, but for various reasons the idea was eventually abandoned.

Unlike Boomera, which has no visible outlet, the Blue Lake has a small stream issuing from it at its south-eastward corner, and some half-dozen of the more energetic set off to follow this to its outlet from the hills. The track follows the V-shaped gorge near the stream, which is shaded by a few scrub trees, also the swamp tree-fern, and a few others, while mosses and aquatic plants all help to make one wish for leisure for a more detailed examination.

In about a mile a small amphitheatre is reached, terminating the pass through the line of hills bordering the 18-Mile Swamp on its western side: indeed, I believe it is the only low level pass in the whole distance.

Climbing the near-by bluff, our view extends across the big swamp to the sea, some mile away, and from more prominent positions we might see Point Lookout to the North, and Jumpin' Pin to the South.

A line of sand-hills borders the ocean with patches and chains of vegetation, mostly *Banksias* and *Pandanus*. The reed-covered swamp, unsafe of passage to any but the initiated, is broken by lagoons of varying size, and in places at the foot of the bold line of hills is a more or less continuous creek or chain of ponds.

Beside us here and there, on the more level parts, are patches of shell, and in the bottom of the amphitheatre we have just left is a considerable mound of the same. This is a "Kitchen Midden," perhaps one of the most lasting evidences there is of Australia's original inhabitants. The shell-fish, almost entirely *Eugarie*, have been collected on the outer beach, and carried in dilly-bags to the camp: the natives appear not to have camped at all frequently near the outer beaches, but brought the food by devious and winding wallaby pads, skirting deep pools and treacherous bogs, sometimes by vibrating bridges of peat, to the sand-hills.

These middens are to be found in a number of places along this border-line of hills, their presence evidently marking the better crossing places. Included in the debris, one may always find flakes and splinters of hard stone, used as scrapers and knives when opening the shell-fish: sometimes larger pieces used for breaking, and if one is lucky, a specimen, more often than not broken, of one of the native grinding stones for making flour from the roots of the "Bungwall" fern (*Blechnum serrulatum*).

Every scrap of stone has been carried from other places far distant.

There are numbers of middens on the inner fore-shores of the island, and others also at Point Lookout, but in all cases the shells are of various kinds, according to the varieties and respective quantities of edible shell-fish found in the different localities.

One wonders when sitting here if some of the blacks who made these shell mounds saw with astonishment Captain Cook's vessel, the *Endeavour*, and what their feelings may have been, and so musing, we regretfully face our nine-mile tramp to camp, where we all arrive tired, perhance, but well pleased with a successful day.

NOTES ON A FEW ENTOMOLOGICAL CAPTURES AT STRADBROKE ISLAND, EASTER, 1926.

(By L. Franzen.)

Stradbroke Island, during early spring, is a wonderful collecting ground for an enthusiastic entomologist, but during Easter or autumn, in general, the insect fauna is singularly poor.

Being mostly interested in butterflies, the greater part of my time was occupied in observing or capturing the forty-five species which are listed herewith. The family, Nymphalidae, holds pride of place, with 13 species; Hesperidae just one less (12); Lycaenidae are represented by ten species; Pieridae, 7; and Papilionidae with the modest number of three.

The only butterfly captured of any particular interest was six specimens, five males and one female, of *Mesodina halyzia* Hew. I know of only a single specimen previously being taken in Queensland, viz., on Moreton Island in September, 1908, and recorded by Mr. R. Illidge in the "Queensland Naturalist," Vol. I., No. 3.

Moths I found but few, probably because I did not feel over-energetic in that line, and I only brought home three specimens, which I submitted to Dr. Turner for identification. They proved to be *Ardiosteres moretonella* W.L.K., a rather common species, but the specimen taken was extra fine. *Pingasa deteriorata* (?) W.L.K. —first record of this insect in Queensland. The third moth belongs to the family Xyloryctidae, and proved to be new. When found by me this specimen had just emerged, and was resting on some leaves of a Cypress Pine, which, on examination, was found to be its food plant.

I also took several cocoons of a small xyloryct, found on a species of *Persoonia*, which has since emerged, and proved to be *Neodrepta luteotocella*, W.L.K. The breeding of this little moth from *Persoonia* sp. was very interesting to me, as I have previously obtained them on *Banksia integrifolia*.

Neuroptera next called my attention, and the following species were recorded:—*Myrmelion uniseriatus*, Gerst., *M. pictifrons*, Gerst., *Formicalion vafer*, W.L.K.V., and *Austrogymnocnemis pentagramma*.

The only remaining capture worth mentioning is that of a very strikingly marked fulgorid *Privesa execta*, of which I found four specimens on a Cypress Pine tree. Only once before have I seen this pretty insect in the Brisbane district, but in the vicinity of Rockhampton I found it to be by no means uncommon.

LIST OF BUTTERFLIES COLLECTED.

Family Nymphalidæ.

No. 1, *Danaida archippus*, Fab.; 2, *Danaida affinis*, Fab.; 3, *Danaida petilia*, Stoll.; 4, *Danaida Namata*, McL.; 5, *Euploea Corinna*, McL.; 6, *Melanitis leda*, Fab.; 7, *Hypocysta pseudirius*, Butl.; 8, *Hypocysta adiante*, Hub.; 9, *Phaedyra shepherdii*, Moore; 10, *Precis villida*, Fab.; 11, *Hypolimnas nerina*, Fab.; 12, *Acraca andromacha*, Fab.; 13, *Eulepis sempronius*, Fab.

Family Lycaenidæ.

No. 14, *Philiris innotatus*, Misk; 15, *Candalides xanthospilos*, Hub.; 16, *Candalides erinus*, Fab.; 17, *Candalides hyacinthina*, Semp.; 18, *Candalides acasta*, Cox; 19, *Thysonotis taygetus*, Feld.; 20, *Nacaduba florinda*, Butl.; 21, *Lampides damoetes*, Fab.; 22, *Zizina labradus*, Godart; 23, *Ogyris olane*, Hew.

Family Pieridæ.

No. 24, *Delias argenthona*, Fab.; 25, *Delias nigrina*, Fab.; 26, *Elodina angulipennis*, Lucas; 27, *Iluphina scyllara*, McL.; 28, *Appias ega*, Boisd.; 29, *Catopsilia pomona*, Fab.; 30, *Terias Zoraide*, Feld.; 31, *Terias smilax*, Don.

Family Papilionidæ.

No. 32, *Papilio aegeus*, Don; 33, *Papilio choredon*, Feld.; 34, *Euryeus Cressida*, Fab.

Family Hesperidæ.

No. 35, *Trapezites iacchus*, Fab.; 36, *Trapezites eliana*, Hew.; 37, *Trapezites petalia*, Hew.; 38, *Trapezites maheta*, Hew.; 39, *Mesodina halyzia*, Hew.; 40, *Toxidia peroni*, Lat.; 41, *Toxidia parvula*, Ploetz; 42, *Padraona flavovittata*, Lat.; 43, *Padraona lascivia*, Ros.; 44, *Telecota Krefftii*, McL.; 45, *Parnara mathias*, Fab.; 46, *Hasora mastusia*, Fruh.

SOME RECENT AVIAN VISITORS AT BULIMBA, BRISBANE RIVER.

(By R. Illidge.)

A few days ago we were surprised just about sundown by the visit of a solitary top-knot pigeon—*Lophotaemus antarcticus*. Whether it came for shelter during the night or to feed on the berries of the camphor laurel in which it finally rested, we could not find out, as it made several heavy flops from one branch of a fig-tree to others in the laurel before making itself comfortable. We did not see it eating anything, but its double crest and hawk-like appearance were very noticeable even in the dim light. In the morning we forgot to look until too late, and it had apparently gone.

This morning (14th March) a small flock of four or five blue-faced honey-eaters arrived about sun-rise and settled in the large fig-tree overlooking the street. After a deal of loud chatter, probably finding we had nothing edible to suit their palates, they departed for breakfast to some more congenial spot over Breakfast Creek way.

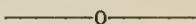
Neither of these two birds has ever, to my knowledge, visited this part before, and in the case of blue-face, a fig-tree is a most unlikely resort. The blue-faced honey-eater is yet uncommon in the environs of Brisbane, and we have seen it on many occasions as at Hopedale, Albert River, and Wellington Point. The top-knot pigeon is becoming notably scarce; even in remote parts no such great flocks are now seen as once frequented the jungle tracks around Brisbane in its early days.

Soon after the departure of the blue-faces, another visitor, a large solitary bird arrived, settling in a silky-oak and being very active, and uttering no call, it could not be very accurately observed. I thought it might be a brush-wattle bird (*Acanthochœra carunculata*) which also I have never before noted here, though *Anellobia mellivora*, a much smaller bird, has been frequently seen, especially when the silky-oaks are in flower.

If the present weather conditions continue much longer we may expect many country visitors in the way of western birds rarely seen otherwise near the coast or even east of the Main Range, so it would be well if these were carefully noted by our bird students, and particulars sent in to the Club for publication in "Naturalist."

There is a pair at least of the fine red-backed hawk (*Haliastur leucosternus*, Gld.) also known as the white-headed Sea Eagle, now flying about the river at Bulimba. These or others have been with us ever since we came to Bulimba over 41 years back. They sometimes perch on the old fender piles of the wharf now fast falling to decay. I often watch them, for they are always a pleasing sight.

We sometimes hear the call of the fish-tail flycatcher or Drongo (*Chibia bracteata*) though they will soon be departing now on their northward quest. They usually arrive here at the advent of summer, in fine feather, but depart in poor condition. The rufous fan-tail (*Rhipidura rufifrons*) is now in evidence in our garden, but the white-shafted (*Rhipidura albiscapa*) has not yet left its summer home in the mountains. Last December both these birds were abundant on Roberts Plateau, and I have also noted *R. albiscapa* at Toowoomba on the Range during the same month.



A REMARKABLE ABERRATION IN A COMMON BUTTERFLY.

(By L. Franzen.)

Of the two butterflies shown on Plate 1. the one to the left is a typical example of our common skipper *Trapezites eliena* Hew. On the right is a remarkable aberration of the same species. The difference in this specimen from typical form are as follows:—

Above:—Forewings bronze brown, discal area finely dusted orange, cell spot irregular and reduced in size, total subapical spots, elongate discal spots in area, two and three, a minute and obscure dot in area two, and spot in area one, small and practically emerged in the pale orange streak, parallel to dorsum.

Above.—Hind wings bronze brown, faintly dusted orange, otherwise typical.

Beneath.—Fore-wings in colour as in typical form, but paler, subapical spots present, but very obscure, discal spot in area, three very small and almost round.

This aberrant butterfly is the property of Mr. A. J. Beck, from whom I have obtained a specimen on loan for the purpose of publishing these notes. The capture of this very rare form was effected by Mr. Beck at Virginia, near Brisbane, in September, 1924.



Glenoleon Franzeni, male.

[Photo, ESSEN-PETERSEN.]



Trapezites eliena Hew.

Left: Typical specimen.

Right: Aberration.

[Photo, J. C SMITH.]

AUSTRALIAN NEUROPTERA V.*

(By P. Esben-Petersen, Silkeborg.)

In a small collection of Ant-lions, sent me by **Mr. L. Franzen**, Brisbane, I had the great pleasure to meet with a new species, of which I give a description below. I thank **Mr. L. Franzen** very much, that he has given me the opportunity to see the material, because Australian Neuropterous insects are only rather seldom met with, and I know very well that much work has yet to be done before the Australian Neuropteroid-fauna is tolerably explored.

Glenoleon Franzeni, n.sp.

Face yellowish, palpi greyish yellow with paler joinings; between the eyes a broad jet black band, enclosing the insertion of the antennae. Above this band a narrow yellowish cross-band. Vertex reddish yellow with black markings. Antennae, black with narrow yellowish joinings in their basal third part; the club oblong, rather inconspicuous. Prothorax a little longer than broad, black, and with five interrupted longitudinal streaks, formed by oblong yellowish spots. Meso and metathorax black with small yellowish markings. Abdomen shorter than hind wings, black with small yellowish markings. On the most segments dorsally and ventrally. Legs rather long and slender. Fore and intermediate femora blackish brown, hind femora pale at base and with a pale band near apex. Fore and intermediate tibiae black with three yellowish bands; hind tibiae yellowish, with a dark band at apex and another near base. Tarsi almost as long as tibiae, black; first and second joint partly yellowish; first tarsal joint almost as long as fifth; spurs hardly as long as first joint. Wings rather broad. Fore wings strongly irrorated; hind wings hyaline in their two basal thirds, and with a broad and rather irregular black pterostigmatical cross band; apical part of hind wings with a lacteous tinge, and with a black mark at fore margin of the wing. At base of hind wing a "pelote" in the male sex. Venation of fore wings blackish; a few cross veins and parts of some longitudinal veins whitish. In the hind wings the venation is partly blackish and partly whitish.

(*Nos. 1-4 have appeared in the "Proceedings of the Linnean Society of N.S. Wales.")

Fore wing 31-35 mm.; hind wing, 28-31 mm. 10 and 29, Brisbane, 1926 (**L. Franzen** leg.)

(Type one male and one female in Coll. Franzen one female in the author's collection.)

I take the liberty to name this interesting species in honour of its collector.

As to the form of the wings, the species has much likeness to **Glenoleon dissolutus** Gerst., **radialis** Banks and **pulchellus** Ramb. (the broad-winged species), but with regard to the markings of the wings it occupies a position between **Glenoleon dissolutus** Gerst. and **pulchellus** Ramb.

Glenoleon meteoricus.

Gerstaecker, Mitt. naturw. Vereins Neuorpom. und Rügen, pag. 25, 1884; **Esben-Petersen**, Australian Neuroptera ii (Proc. Linn. Soc., N.S. Wales, pag. 73, pl. xii, fig. 22, 1915.

Brisbane, 25/1/1925 (**L. Franzen** leg.)

This species seems to be a very scarce one; before I have only seen one specimen (collection **Froggatt**.)

Austrogymnocnemia pentagramma.

Gerstaecker, Mitt. naturw. Vereins Neuorpom. und Rügen, pag. 34, 1884; **Esben-Petersen**, Australian Neuroptera IV. (Proc. Linn. Soc., N.S. Wales, pag. 587, pl. XLV. fig. 7, 1923.

Brisbane (**L. Franzen** leg.)

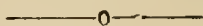
I have only seen the type-specimen of this species.

Dictyoleon nervosus.

Esben-Petersen, Australian Neuroptera, IV. (Proc. Linn. Soc., N.S. Wales, pag. 585, pl. XLVI, fig. 18, 1923).—Fiji Islands.

Weelius triseriatus Banks, Bull. Mus Comp. Zool. Cambridge, pag. 435, 1924.—Fiji Islands.

Of this very interesting species I have since seen more material (Imp. Bureau of Entom.) only known from Fiji Islands, from the same localities.



Fox on the Tambourine Road.—On a recent journey from Tambourine to Beaudesert by road, a fine specimen of Red Reynard the fox was seen going easily across a paddock. Needless to say, ground birds were very scarce along the way.

L. M. MAYO.

A PREVIOUSLY UNDESCRIBED DODONAEA FROM SOUTH-EASTERN QUEENSLAND.

(By C. T. White, Government Botanist, Brisbane).

Dodonaea rupicola sp. nov.

Frutex ca. 1m. altus, ramulis teretibus molliter pubescentibus. Folia pinnata, usque ad 4-5 cm. longa; rachide alata; foliolis 10-12 obovato-cuneatis vel late lanceolatis, 5-7 mm. longis ca. 2-plo longioribus quam lata, utrinque pilis longis albis obsitis, marginibus recurvis. Flores breviter pedicellati 3-4 in axillis dispositi, in axillis superioribus saepe confertis et racemos terminales simulant; sepalis ovato-lanceolatis apicem versus angustatis ca. 4 mm. longis dorso et marginibus pilis longis vestitis; staminibus 7-8 falcatis, 2.5 mm. longis dorso hirsutis filamentis brevissimis; ovario dense hirsuto; stylo 1.2 cm. longo. Capsulae hirsutae; alatae, cum alis 1 cm. diam., breviter pedicellatae, pedicellis 2 mm. longis; alis rotundatis, 2 mm. latis leviter crispatis; seminibus opaquis rotundo-reiniformis.

A shrub about 1 metre high. Branchlets terete, softly hirsute as well as the leaves, with rather long soft hairs. Leaves pinnate, up to 4.5 cm. long, the rachis winged, leaflets 10-12 obovate-cuneate to broadly lanceolate 5-6 mm. long, twice as long as broad, margins recurved, clothed with long white hairs on both faces. Flowers shortly pedicellate, 3-4 clustered in the axils; those in the upper axils often crowded and simulating terminal racemes. Sepals ovate-lanceolate, broad in the lower part much narrowed towards the apex, about 4 mm. long, clothed with long white hairs on the back and margins. Stamens 7-8, falcate, 2.5 mm. long, hirsute on the back with long white hairs especially towards the top, rudimentary ovary in the male flowers, glabrous, ovary in the female flowers densely hirsute; style 1.2 cm. long. Capsules on short slender pedicels of 2 mm., hirsute with long hairs, about 1 cm. diameter, wings rounded, about as broad as the carpels, the edges slightly crisped; seeds opaque, rotund reniform.

Queensland:—Growing between rocks, Saddle-back Mountain, Elimbah, Glass House Mountains district (about 30 miles north of Brisbane), C. T. White, Queensland Naturalists' Club Excursion, 11/9/1926.

Very close to *D. vestita* Hook and *D. pinnata* Sm., from both of which it differs in its smaller, very shortly pedicellate capsules.

REPORT ON THE BOTANY OF THE QUEENSLAND NATURALISTS' CLUB EXCURSION TO ELIMBAH, 11th-13th SEPT., 1926.

(By C. T. White, Government Botanist, Brisbane.)

The prevailing type of country around Elimbah is of the open forest type, common in sandy tracts in South-Eastern Queensland. Eucalypts, of course, formed the main tree types; the commonest perhaps was *E. micrantha* (the Scribbly Gum); others present in different situations were:—*E. microcorys* (Tallow-wood), *E. pilularis* (Blackbutt), *E. paniculata* (Grey Ironbark), *E. eugenoides* (White Stringybark), *E. acmenioides* var. *carnea* (Yellow Stringybark), *E. corymbosa* (Red Bloodwood), and *E. trachyphloia* (White Bloodwood). On the poorer, low-lying, badly drained country *Eucalyptus Seeana* (Narrow-leaved Grey Gum) was very abundant. The trees are particularly abundant between Caboolture and Elimbah, and though the trees themselves are mostly on the small size, they represent a particularly coarse form as regards the leaves and floral parts. Other trees of the open forest were:—Acacias of several species, e.g., *A. Cunninghamii*, *A. aulacocarpa*, *A. penninervis*, and *A. complanata*. The Protaceae were represented by *Banksia integrifolia* (White Honeysuckle), *Persoonia media* and *P. virgata* (Geebung) and *Xylomelum pyriforme* (Wooden Pear). *Casuarina torulosa* (Red Oak) and *C. suberosa* (Forest Oak) both occur in the open forest. The Hop Bush (*Dodonaea triquetra*) was everywhere abundant. Along the creeksides where moister conditions prevailed, a number of trees distinctive of creek and river sides in Southern Queensland were found, e.g., *Casuarina Cunninghamii* (River Oak), *Agonis abnormalis* (a Water Gum), *Petalostigma quadriloculare* var. *glabrescens* (Quinine Berry), and *Acacia implexa* (Broad-leaved Sally). Of this last, fair-sized trees were seen bearing bipinnate foliage, the phyllodes on the younger trees were narrow and long, being markedly different

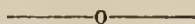
from those on the adult trees. A few trees were seen of *Eugenia cyanocarpa* (the Blue Lilly Pilly). A very common shrub was *Leptospermum flavescens* (Wild May). In parts, *Hovea acutifolia* (Shrub or Bush Sarsaparilla) and *Elaeocarpus cyaneus* were very abundant shrubs.

In the swamps the most abundant tree was the Broad-leaved Tea Tree (*Melaleuca leucadendron* var *viridiflora*). This in places, was replaced by another species, *M. linariifolia*; in somewhat drier areas *M. nodosa* was found. In some large swampy forests *Eucalyptus robusta* was the common tree. This is often called the Swamp Mahogany, but this sobriquet is more often applied to *Tristania suaveolens*, with which it is often associated.

A small peat swamp was examined and yielded, among other plants specimens of *Leptospermum scoparium*, *Leptospermum Liversidgei* (Citron-scented Tea Tree), *Callistemon pachyphyllus*, *Agonis Scortechimiana*, and *Hakea gibbosa*?

In badly drained country bordering on the swamps, but perhaps not actually swampy, two interesting under-shrubs were *Melaleuca thymifolia* and *Hakea florulenta*.

The most interesting area visited was the Saddlebaek Mountain, one of the trachytic hills of the Glass House Mountains series. On and around the summit were several interesting shrubs, e.g., a new species of *Dodonaea* (*D. rupicola*), *Agonis Leuhmanni*, only known previously from the top of Mt. Ngun Ngun, and *Leptospermum microcarpum*. These three shrubs, together with the more widely distributed *Calythrix tetragona*, represented the bulk of vegetation on the top of the mountain.



NATURE LOVERS' LEAGUE.

Excursions with second-year students from the Teachers' Training College have been continued on the last Friday in each month. The July excursion was held at the Queensland Museum, when the Director, Mr. H. A. Longman, gave a most interesting lecture on Australian animals. This was followed by a walk through the galleries, where Mr. Longman had the able assistance of Mr. H. Hacker (insects), and Mr. Marshall (fishes).

The August excursion was held at Sunnybank, and was devoted to Botany, the wild flowers being in great profusion. Explanatory notes were given on the different species of flowers and trees by Messrs. D. A. Herbert, G. H. Barker, and C. T. White.

The September excursion was held at Ashgrove, when the opportunity was taken of the visit to Brisbane of Mr. A. H. Chisholm, of Sydney, a past president of the Queensland Naturalists' Club, and present President of the New South Wales Branch of the Royal Australian Ornithologists' Union, to deliver a short lecture on the teaching of nature study in schools.

Mr. Chisholm remarked that it was not difficult to learn about birds. One drifted into it on no set method. He himself had studied in the "university of the bush." They could go about the bush and fill in their time very pleasantly studying natural history. Bird study would not be of any use to them if they made it a hard and fast curriculum. It would be better to leave the subject alone altogether, if they did not approach it with a certain amount of humanity.

It would be the duty of the student teachers in the future to come in contact with many children, and he hoped they would interest their pupils in nature study, so that they would make it part of their lives. The first thing a growing child noticed was a flower, and then its awakening intelligence seized upon the birds. "If you are going to do any good for the children," said Mr. Chisholm, "you must investigate natural history as a hobby. Do not worry about hard and fast methods. You will get science in time. Also, do not let any of the children you chance to teach get into their heads that this is a hard and fast subject to be hammered into them like arithmetic. Make it a hobby, and a pleasure in your life and theirs.

Later in the afternoon the party divided up into sections under the leadership of Mrs. W. M. Mayo (Hon. Secretary), Mr. G. H. Barker, and Mr. Chisholm, to ramble along the creek-side and study what birds could be observed.

The last meeting of the year was held on Friday October 29th, when lectures, illustrated by lantern slides on Australian plant life were delivered at the Biology Department of the Queensland University by Messrs. D. A. Herbert, M.Sc., and C. T. White.

BIRD NOTES FROM STRADBROKE ISLAND.

(By J. E. Young.)

I would like to place on record several birds seen during June, 1926, on an excursion to Stradbroke Island. With the exception of the last, I have not previously seen any of these recorded for the locality:—Pheasant Pigeon (*Macropygia phasianella*); Golden Breasted Whistler (*Pachycephala pectoralis*); White Headed Tree Runner (*Nesotitta leucocephala*), numerous; Flame Robin (*Petroica phoenicia*), a female seen and a male on Russell Island, adjoining; Tree Creeper (*Climacteris superciliosa*), numerous.

With the exception of the pigeon, all were found in a particularly retired spot, not easy of access.

ORCHID SECTION OF THE FIELD NATURALISTS' CLUB OF VICTORIA.

We learn from the August issue of the "Victorian Naturalist" that a meeting of those interested in the study of Victorian Orchids was held recently, when it was resolved that an orchid section of the Victorian Club be formed. The aims of the section are:—

(1) To partake in the intensive study and protection of native orchids; and (2) the infusion of knowledge regarding them.

There is no doubt that the foundation of such a body will do much to further the study of these interesting plants, as it is only by the co-operation of all interested and the collection of a large series of specimens for examination by specialists, that many doubtful points concerning the classification of native orchids can be cleared up.

Mrs. Edith Coleman, of Walsham, Blackburn, Victoria, who has been one of the prime movers in the formation of the section, writes that she is very anxious to exchange specimens of Victorian orchids for those of Queensland. Members willing to exchange might write Mrs. Coleman direct. The Hon. Secretary of the Orchid Section is Mr. P. Morris, National Herbarium, South Yarra, Melbourne, Victoria.

"ORANGE" BIRDS.

In a recent number of the "Emu" on "Birds of the Cardwell district," Mr. Barnard mentions that the Macleay honey-eater (*Meliphaga Macleayana*) is said to be fond of oranges, piercing the rind and sucking the juice of the fruit. The Lewin honey-eater (*M. lewini*) is called the "orange" bird by the folk of Tambourine Mountain because of the same habit. These birds (Lewins) have been very busy among the orange trees on Highgate Hill (Brisbane), doing their work so neatly and thoroughly that you don't know the orange skin is hanging empty until you pick it.

Lewin honey-eaters, together with the dainty spine-bill, are very plentiful in the suburbs of Brisbane this winter.

L. M. MAYO.

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NOTES ON BIRDS OBSERVED ON EXCURSION TO UPPER BROOKFIELD.

Bird life in mid-winter is not plentiful, but the bird observers (Mrs. W. M. Mayo and Messrs. Barker, Berney and O'Neil Brennan) had an excellent day, recording forty odd species. With the birds usually found among the hills round Brisbane in winter were bee-eaters (*Merops ornatus*) and the sacred kingfisher (*Halcyon sanctus*). Those two species belong to the migratory birds, and should not be in Queensland at mid-winter. Perhaps the mild winter is responsible. Whip birds, thrush, the white-browed scrub wren, honey-eaters, (the Lewin, the spine-bill, the white-naped and the yellow checked) sang in the lantana scrub around the farms as though they anticipated spring. Along the creek red-browed finches and wrens fraternised with the brown honey-eaters and little grass bird. Rosella parrots—crimson and pale-headed—fed among the roadside thistles, and the furrows of the ploughed land. The yellow robins and white shafted fantail were very plentiful: and during the day both wedge-tailed and white-breasted sea eagles were soaring overhead. Tree tits twittered among the leaves of the big gum trees—darting out from the leaves and hovering for a moment or two inspecting their possibilities in the food line.

They never stayed long enough in view to make an observer quite certain of their species, but they looked like striated Thornbills. Golden-breasted whistler and the "Tricolor Triller" (*C. leucomela*) were among the "unusuals" recorded during the day.

Honour for Mr. R. Illidge.—The Royal Zoological Society of New South Wales has elected Mr. R. Illidge, the veteran Queensland Entomologist, to hon. membership. In the letter of advice, the Hon. Secretary of the Society (Mr. A. F. Bassett-Hull) wrote:—"This election, upon the nomination of the Entomological Section of the Society, is made in recognition of the distinguished service you have rendered to Australian Zoology, and is the first election under the article relating to Honorary Associate Members."

Flora of Papua.—At the last monthly meeting of the Royal Society of Queensland, Mr. C. T. White (Government Botanist) read a paper by Mr. W. D. Francis and himself on the plants collected in Papua by Mr. C. E. Lane-Poole. Mr. Lane-Poole was appointed to report on the forest resources of Papua, and for this purpose visited the territory in 1922-3. He was later commissioned by the Commonwealth Government to report on the forest resources of the Mandated Territory of New Guinea. The results of his work in the two regions have now been published as a Parliamentary paper by the Commonwealth Government, and add considerably to our knowledge of the flora of New Guinea. His account of the forest regions of Papua is particularly interesting; he divides the forests according to altitude, viz., Lowland forests (0-1,000ft. above sea level), foothill forests (1,000-5,000ft. above sea level), mid-mountain forests (5,500-7,500ft. above sea level), mossy forests (7,500-11,000ft. above sea level), and alpine forests, those occurring at an altitude of over 11,000ft. He then describes most of these in more or less detail; the first type is described under the three main headings, savannah forests, rain forests and mangrove forests. The work makes a distinct advance to our knowledge of the forest flora of Papua.

Mr. Lane-Poole's collection is particularly interesting, as he made special efforts to obtain specimens of the larger forest trees, plants often neglected by the general collector.

A particularly interesting find, from the point of view of plant geography, was that of a new species of *Achradotypus*, a genus of Sapotaceae only previously known from New Caledonia. This has been named by Messrs. Francis and White as *Achradotypus benefiei* from the fact that it is a sorcerer's tree and much revered, though feared by the natives in consequence.

Since 1918 there has been some activity displayed in elucidating the flora of Papua (British New Guinea), though the efforts have been spasmodic, and a great deal yet remains to be done, for Papua is a country indescribably rich in plant forms.

Queensland Fruit Flies.—At the September meeting of the Royal Society of Queensland a paper on Queensland Fruit Flies was read by Mr. Henry Tryon. Twelve new species are described belonging to the genera *Chaetodaenus*, *Dacus*, *Rioxa* and *Batrocera*. For the common Queensland fruit fly (*Chaetodaenus Tryoni*) forty-three commonly cultivated fruits and twenty-nine native fruits are listed as hosts.

Memorials to the late J. H. Maiden and the late Chas. Hedley.—Movements are on foot to commemorate the names of these two great Australian naturalists. In the former case it is proposed to erect a J. H. Maiden Memorial Pavilion in the Botanic Gardens, Sydney, and in the latter it has been suggested that the memorial might take the form of a Hedley Lecture to be delivered at each session of the Australasian Association of the Advancement of Science

The Queensland Naturalist.

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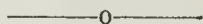
PROCEEDINGS.

ANNUAL MEETING, 21st FEBRUARY, 1927. The President (Dr. E. O. Marks) presided over an attendance of about 35 members. Mrs. Rowley, Miss Lucas, Miss Marion Cock, and Mr. Gillett were elected members of the Club. The annual report of the Council was read and adopted. The Financial Statement, as read by the Hon. Treasurer, showed a credit balance of £21/9/2. Office bearers for the ensuing year were elected, as set forth on the cover page of this issue. An address was delivered by the retiring President (Dr. E. O. Marks), who took for the scientific portion of his address a talk on "Streams and Their Past," illustrating his remarks by means of a map and photographs of the river and creek systems of South-Eastern Queensland.

EVENING MEETING, 19th MARCH, 1927. The President (Mr. D. A. Herbert) presided over an attendance of about 30 members. Reports on the excursion to Kalinga Park were given by Dr. F. W. Whitehouse (plant fossils), Mr. C. T. White (general botany), Mr. L. Franzen (entomology), and Mr. G. H. Barker (ornithology). Mr. D. A. Herbert exhibited samples of prepared gum leaves (*Eucalyptus* spp.) that were being put on the market as a commercial tobacco, especially recommended to those suffering from asthma and chest and throat complaints. Mr. L. Franzen exhibited specimens of bananas badly damaged by the larvae of a noctuid moth (species not yet determined); this insect was causing great damage in the Kileoy district. Fossil specimens from Sherwood were shown by Mr. J. E. Young.

EVENING MEETING, 20th APRIL, 1927. The President (Mr. D. A. Herbert) occupied the chair. A general account of the flora of Russell Island based on collections and observations made during the Easter

camp-out of the Club was given by Mr. C. T. White. A general account of the geology of the island and neighbouring localities was given by Dr. E. O. Marks, who exhibited rock specimens from Cobby Cobby and Stradbroke Islands. A fine series of photographs taken during the Easter camp-out were exhibited by Mr. G. A. Rowley. Miss E. E. Baird exhibited a specimen of fungus mycelium (*Xylostroma*) consisting of felt-like material found between the growth rings of a eucalypt timber. Mr. D. A. Herbert showed germinating mango seed, illustrating polyembryony, also a specimen of seedling tree of the Hoop Pine (*Araucaria Cunninghamii*), showing good growth in spite of root injury. Miscellaneous exhibits under the microscope were shown by Mr. Gillett. Mr. C. T. White exhibited specimens of *Datura ferox*, and a wad of gummy or rubber-like substance picked off the front tires of a motor car after travelling over fields of *Boerhaavia diffusa*, the Tar Vine or Sticky Weed.



ANNUAL REPORT OF THE COUNCIL FOR 1926.

Your Council has the pleasure of submitting the 21st Annual Report of the Queensland Naturalists' Club.

Meetings.—Ten Council meetings, eight general monthly meetings, two special meetings, a wild flower show, and eight field excursions have been held. During the year lectures, in many cases illustrated by lantern slides, have been given by Prof. H. C. Richards and Messrs. D. A. Herbert, E. F. Pollock, Tom Tredale, J. E. Young, and A. H. Chisholm.

The Wild Flower Show was held on a smaller scale than that of last year owing to the smaller size of the only available hall. Its success was due to the help from many country friends and city members.

Excursions.—The Hon. Excursion Secretary (Mr. J. C. Smith) reports that eight excursions were held during the year, the places visited being Goodna, Myora (Easter), Brookfield, Woodridge, Sunnybank, Elinbah, Nudgee and Ashgrove. The Myora and Brookfield excursions were well attended, but the attendance at the others was below the usual. Interesting collections were made, however, on most of the trips.

Membership.—Seventeen new members were enrolled and fourteen resignations received. There are now 119 members on our roll.

Obituary.—It is with deep regret that the passing of three members is recorded. Mrs. Gorton, of Mullet Creek, a country member; Mr. Finckh, of Sydney, who was well known to all interested in aquatic life; and Mr. Chas. Hedley, doyen of Australian naturalists.

"The Queensland Naturalist."—It is recorded with satisfaction that four issues of the journal have been published during the year.

The Nature Lovers' League.—At the Annual Meeting Mrs. Mayo was elected Hon. Secretary of the Nature Lovers' League, and at the Council meeting, held on 8th March, Messrs. White, Barker, Gaukrodger and Herbert were appointed to act with her as a committee to manage the business of the League. Good work, as reported in the pages of the "Queensland Naturalist," has been accomplished.

Skertchly Memorial.—A committee consisting of representatives of various societies in which the late Professor S. B. J. Skertchly was interested, has in hand the erection of a tombstone over his grave at Nerang. Donations amounting to over £40 have been received.

Library.—The Librarian (Mrs. J. C. Smith) reports that 278 magazines were received from various scientific societies and institutions throughout the world. These were in exchange for the "Queensland Naturalist," of which 94 copies were distributed of each number. In all 105 volumes and parts of periodicals were borrowed by members during the year.

General.—During the year complaints have reached the Club regarding the violation of the Sanctuary Laws. These complaints have been passed on to the authorities concerned. It has been noticed that under the provisions of the Native Animal and Birds' Protection Act, 1921, five rangers have been appointed by the Government, and it is hoped that this action will help to preserve our interesting animal and bird life.

Through the interest of the President, the owners of the ground on which the Bora Ring at Samford is situated have erected a fence around the ring, protecting it from straying cattle, etc.

E. O. MARKS, President.

E. E. BAIRD, Honorary Secretary.

STREAMS AND THEIR PAST.

(By Dr. E. O. Marks.)

(Presidential Address delivered before the Queensland Naturalists' Club, 21st February, 1927.)

Who has not regarded with admiration and wonder a mountain range, or some isolated peak? How beautiful, how grand, how enduring those "everlasting" hills. Yet it is a commonplace of geologists that these everlasting hills are really the most evanescent features of the landscape, and are, generally speaking, much younger than the streams. Earth movement, shall we call it "some convulsion of nature," may elevate a plateau or mountain mass, but the carving of it into the mountain and valley as we know them, is the work of water. Tennyson's talkative brook should have said: "Hills may come and hills may go, but I go on for ever, carrying away their debris until there is nothing left to carry." In a sally, or perhaps a bickering, it might even have uttered the jibe: "What ailed ye ye mountains that ye skipped like rams and ye little hills like lambs?"

To be more serious, the streams are usually the oldest, as they are certainly the most active, and therefore really the predominant feature of the land surface.

They have a history which has probably left its mark upon them, so that a consideration of their various characters may possibly yield information not otherwise obtainable about their own former condition, and the land surface over which they originally flowed.

Before discussing some of the features of the streams in this corner of the State, we must first consider the manner in which a stream acts in carving the landscape.

Let us suppose that a land mass is suddenly raised above the sea and exposed to the weather. The surface cannot be absolutely flat, the rain water will collect in the hollows, however slight, and find its way to the edge over which it will fall into the sea. Quickly the nascent stream will cut back into the edge of the plateau, forming first a cataract and then a gorge. This must of necessity follow up the stream which is doing the cutting, and so must come to occupy more or less closely the original depression in the surface.

In the process the original waterfall, with all the fall in one place, becomes a cataract, then a torrent, and

so on as the gradient lessens on the stream, cutting down its bed.

Now, the greater the volume of water the stronger the current, and the greater power of transporting rock debris to grind away the bottom. Also the steeper the grade the more rapid the current, and again the greater transporting and erosive power.

A river thus cuts down its bed most rapidly where a combination of grade and volume are at a maximum, and it cuts it down until a grade is attained, which just permits it to carry away its load of debris. If owing to altered conditions the gradient or volume is insufficient to provide the necessary current, the debris will be deposited, and the river build up its bed.

We thus have a kind of natural balance, which results in a small stream with less volume of water, requiring a steeper grade to transport its load of sediment than is required by the larger stream, which, moreover, being as a rule further from its source, usually has a finer sediment to carry.

A stream thus tends to acquire a peculiar gradient, steepest near its head and flattest near the sea, but always in process of getting flatter and flatter as the general level of the land is reduced.

The gradient of a stream may thus be some evidence of its youth or its old age, or of a rejuvenation owing to some alterations in levels by earth movements.

While the stream is cutting down its bed, the sides of the valley it is forming are gradually washed down so that the gorge becomes a wider and wider valley, until eventually all the higher ground is washed away, and the general level is very little above the sea. In this way the narrowness of the valleys may also be some indication of the youthfulness or maturity of a stream. But it must not be forgotten that the steep grade or narrow valley depend originally on the elevation of the land, and that a land of low relief near sea level may never have been sufficiently elevated to acquire these "youthful" characters, namely, steep grade and narrow valleys, although the land may really be quite recent.

The above brief story of the life and work of a stream gives us a picture of the process going on in every water course, a picture to always bear in mind. Were it the whole truth, the matter would be comparatively simple, but unfortunately it is not. It is very improbable that any block of land was ever so raised, suddenly, and

in one movement, and without tilting or folding to some extent. More probably has denudation gone on, while elevation or tilting has been slowly taking place. Probably seldom has this so-called cycle of erosion been completed without interference by renewed earth movement. Moreover, there was in the above story the quite unjustifiable assumption that the land was of uniform structure, whereas we know that various rock types resist very differently the action of stream or weather, and that geological structure must modify the process considerably. Nevertheless the ideal stream gives us a very useful picture of the process taking place, with more or less modification in every valley.

Particularly from it we must realise how permanent is the position of a stream owing to the rapidity with which, aided by its load of debris it can cut down its bed. Only a geologically rapid change of levels can seriously divert a stream, a change of levels more rapid than the stream's power of erosion.

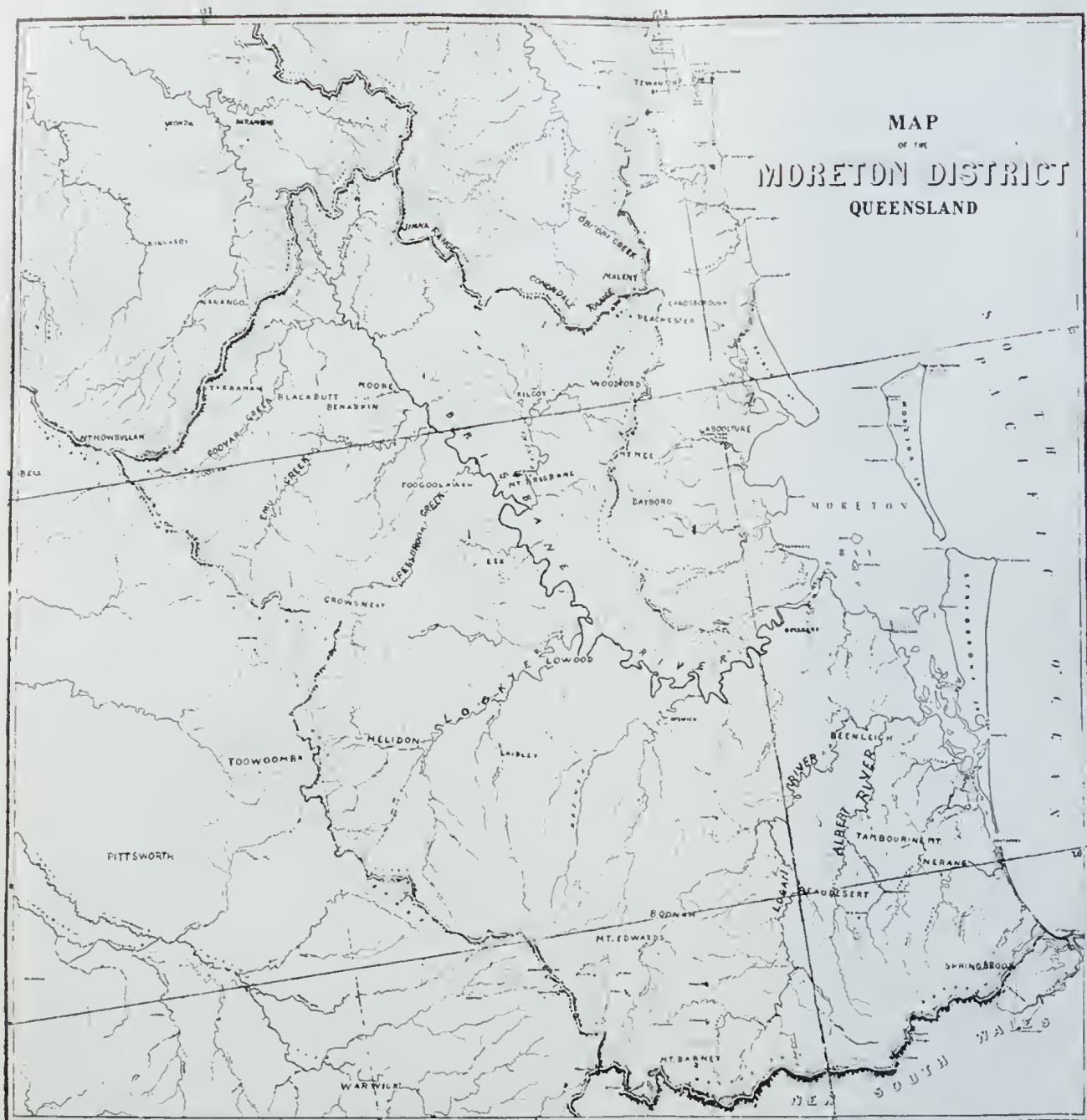
If as a general rule streams maintain more or less their original position, what are the circumstances which determine that position?

We can only surmise what these might be, but it is obvious that any chance development of a stream just by eroding back its head at the expense of the stream on the other side of the divide must yield an irregular arrangement of the main stream and its tributaries.

Where there is a marked parallelism in neighbouring streams or a regular course, we may be reasonably certain that here there was no chance development of erosion, but that the position of the stream had been determined by some previously existing circumstance. For instance a uniform general tilting of a flat surface might give rise to roughly parallel streams, as also might the even surface of a lava flood, which would have a regular declivity away from the focus of eruption. A gentle warping of a flat surface into parallel ridges and hollows would also produce parallel streams.

Apart from the original position of a stream it is generally recognised that occasionally, owing to some favourable circumstance the head of one stream may cut back and capture part of another stream, thus diverting the water into another channel.

Having now referred to the essential principles of river development, in-so-far as they affect our enquiry, we are in a position to consider a few peculiarities of our



rivers in this corner of Queensland, and a few of the problems which they present, and which, I hope, may receive the attention and further observation of our Club members, as opportunity may arise in the field.

The Brisbane River appears to be a compound stream. The lower part receives few large tributaries, but above the junction of the Bremer the drainage basin opens out like a fan, North, West, and South. In this general arrangement of its main tributaries there is a marked similarity to the Burnett, Fitzroy, and Burdekin, and a dissimilarity to most of the other rivers of Queensland. It was suggested some years ago by Dr. Danes that the Burdekin and Fitzroy might owe their peculiar arrangement of tributaries to their having at one time formed the basins of inland lakes, the water of which had subsequently found egress to the sea, or been "captured" by what is now the lower part of the main stream. The possibility of this explanation applying to the Brisbane River is interesting, and investigation may in future show some light on the question. I have none to offer.

In both its upper and lower portions the Brisbane River twists and turns from one meander to the next in an irregular manner.

In a general way river meanders are usually regarded as especially characteristic of the final stages in the life of a stream, being due to its ever widening oscillations from side to side of the soft alluvial plain of its own making. The land inside the loops would thus be alluvial.

This is not the case in the Brisbane. There are some alluvial flats, in places extensive ones, but most of the land inside the loops is solid rock, and often of considerable height.

The outer concave bank is, as is usual, high and steep, while the land on the inner side tapers down to an alluvial flat at the extremity.

A river could hardly, as the result of mere oscillation, develop in solid rock such meanders as, for instance, Kangaroo Point. There is thus some reason for supposing that the meanders were formed and later became "entrenched" as the result of an elevation of the land with consequent cutting down of the river. But we may be wrong in assuming them to be true meanders, for they may represent deviations, due to some irregularity in the original surface or in the geological structure.

Another evidence of recent though smaller elevation occurs in the Brisbane River and neighbouring streams, such as Kedron Brook and the Pine rivers. This is the **existence** of well marked terraces of alluvium above any possible reach of flood at the present time. They show that the streams had formed alluvial flood plains in their valleys, and that an elevation of the land had compelled them to lower their beds till the grade was readjusted to the new levels. These terraces can be recognised almost to the heads of the streams.

One feature of the Brisbane River attracts attention on the merest glance at the map. From the head of the "Western branch," near Nanango, down to the vicinity of Ipswich, the main stream twists and turns about from side to side of a nearly straight line some eighty miles long. The direction of this is N.N.W.-S.S.E. No chance occurrence in the development of a stream could give rise to such a thing; it must be due to a linear folding or faulting of the earth's crust. Geologists have shown on the western side of Ipswich a very large fault, which runs N.N.W.-S.S.E. It has been mapped by the Geological Survey as far north as Northbrook, and it is in line with and indeed coincides with part of the axial line of the upper Brisbane.

There is thus very good reason for thinking that the course of the river was determined by this great earth movement, an association the knowledge of which may some day be of service in elucidating the age of both.

Probably the movement was sufficiently rapid to alter the course of the then existing deep-cut streams, but possibly the country was nearly flat like much of our present-day West, and the movement merely caused a shallow straight valley in the position in which the river has since remained. It might be suggested that the fault merely determined the outcrop of harder rocks on its eastern side, and that the stream was held by these to a course along their margin. Certainly from Northbrook right down to Indooroopilly the river turns from side to side across the boundary of the schists and mesozoic sediments, but its meanders lead it into the hilly schist country as readily as into the softer and less hilly mesozoics, and we shall consider later two examples of smaller streams cutting gorges through mountains of very hard rock instead of making slight deviations to avoid them.

It does not seem likely, therefore, that the course of the Brisbane has been kept along the boundary of the schists merely by their resistance, whatever other reason there may be for it.

The tributaries on the western side of the upper Brisbane, namely Cooyar, Emu and Cressbrook creeks coming from the tableland, are roughly parallel, and run north-east to join the main stream. They are parallel to tributaries of the Burnett waters, draining the same tableland further north, and suggest being part of the one older drainage system now cut off by the newer formed upper Brisbane, and diverted into quite a different direction.

The Stanley is the only large tributary on the eastern side of the upper Brisbane, and its basin is as puzzling as interesting. Rising in the southern end of the Blackall Range it is a not inconsiderable stream at Peachester, in a fairly wide valley. Here, at an elevation of some 500 feet in soft sandstone country, it is less than a mile from, and only about 100 feet below, the divide which separates it from the much lower coastal watershed. Its water, instead of continuing in its initial direction eastwards to the sea, distant only about 12 miles, turns sharply to the west and south-west to join the upper Brisbane, with a distance to travel of approximately 180 miles before reaching the sea.

No satisfactory explanation of this is offered. One might suggest that the basalt of the Blackall Range formerly extended further south, and that the stream was diverted by it, or perhaps formed on the basalt, but this is not a very satisfying explanation, and it is remarkable that its neighbour, to the north, Obi Obi Creek, takes a similar turn away from the coast to join the Mary River.

There is clear evidence in the lower part of the Stanley that the topography when that stream was first formed was not at all similar to the present. Mount Brisbane, 2700 feet high, and little Mount Brisbane, are formed of one mass of fine-grained granite. This mass has been cut through by the Stanley in the gorge which separates the two mountains and forms the site of the proposed dam for the water supply of Brisbane.

The Stanley, running through a wide valley in country of soft rocks, appears to meander into and cut through the mountain of hard granite, instead of avoiding it altogether by taking a similar meander in the opposite direction.

From an inspection of a map showing only the course of the river, it would be impossible to pick out the site of the gorge, the course appearing to be quite unaffected by the fact that a mountain happened to be in the way. The explanation is that when the Stanley first took its course the mountain, as such, did not exist. The granite mass was then covered, but as denudation progressed the granite became exposed, and being more resistant to denudation than the surrounding rocks, the latter have been denuded away, leaving the granite mountain up-standing. The powerful stream has been able to cut down its bed and form a gorge through the granite, while both above and below the gorge denudation has produced a more "mature" type of country in the softer rocks. Clearly the Stanley is older than at least part of Mount Brisbane.

Turning now to the western and southern tributaries of the Brisbane, Lockyer Creek traverses in an E.N.E. direction a very wide alluvial valley from Helidon to its junction with the Brisbane, a wider valley than that of the main stream. It also meanders about a fairly direct line.

Its Southern tributaries, Ma Ma, Blackfellows', and Laidley Creeks have fairly regular courses northward. They are nearly parallel to the streams further east, which also take their origin in the main range, namely the Bremer, Warrill Creek, and Teviot Brook, the latter being part of the Logan River waters. Now, some geologists have suggested that in former times the Main Divide was further east, and that the shorter and more active coastal streams, cutting back their heads more rapidly than the western flowing streams, have caused the divide gradually to be shifted further west. Such a cutting would be rather promiscuous and unequal, one stream pushing ahead of or capturing its neighbours, and so on without any parallelism. The long, roughly parallel streams with fairly regular courses coming from the main divide at an acute angle, hardly support this view.

It has been suggested by other authorities that the Main Range, or at least part of it, is the result of the faulting down of the lower country to the east. On this explanation the courses of the streams are equally inexplicable, as they seem to bear no relationship to the drainage of the other side of the range such as would be

expected on that hypothesis. There is, moreover, one piece of evidence which seems to me to be very clearly against it, in addition to those already put forward on geological grounds by writers disagreeing with the hypothesis.

Reynold's Creek, a main head of Warrill Creek, rising in the Main Range, traverses moderately hilly country for some twelve miles, when it comes to Mount Edwards, 2300 feet high.

This is one of those prominent trachyte mountains so characteristic of the Fassifern and East Moreton districts. It is situated directly in the course of Reynold's Creek, which is here 392 feet above sea level. Instead of being diverted by this mountain of exceedingly hard rock, the creek goes right through it, cutting it into two by the very beautiful gorge.

The position is very closely similar to that of the Stanley River cutting through Mount Brisbane. Again an inspection of the river course on the map fails to show any peculiarity at this place; it seems to go on its way quite unaffected by the existence of a mountain of hard rock right in its path. Again we are driven to the conclusion that when the stream originated the general level of the country was above the present top of Mount Edwards, and that there must have been here a valley rather than a mountain. These trachyte plugs, such as Mount Edwards, are usually regarded as the cores or necks of old volcanoes. If this is so the volcano must have been flattened out so as not to form even the slightest elevation, or else have been covered up by some subsequent deposit when Reynold's Creek started its career. Knowing as we do how the hard trachyte resists weathering at the present time, and on that account forms mountains, we may be certain that the volcano was not flattened out by denudation. The trachyte is generally thought to belong to the Tertiary epoch, and we have no reason to suspect that it can have been covered over by any later sedimentary deposits. There is, however, quite a possibility that it may have been covered over by former eastward extensions of the basalt flows of the Main Range, for these are known in places to cover trachytic rocks.

If the basalt formerly covered Mount Edwards, which is even now, after much denudation, 2300 feet high and about the height of Spicer's Gap, it is clear that there cannot have been any appreciable down-faulting of the

Fassifern area, a conclusion that would equally apply whether the covering of Mount Edwards was basaltic or sedimentary.

To return now to the group of roughly parallel streams, three short ones running into the Lockyer, two long ones uniting only near their junction with the Brisbane close to Ipswich, and one long one running into the Logan, may they not have received their initial parallelism by being formed on the surface of the one lava flow, which they have eroded away.

This is put forward as a suggestion for consideration and further enquiry in the field. There is not enough evidence yet to regard it as anything more than a suggestion, but it is interesting to note that the tributaries of the Condamine, on the western side of the divide, still largely on the basalt, have a marked parallelism to each other.

The Teviot Brook traverses Walloon coal measure country of mild contours near Boonah, but before joining the Logan, cuts through a range of sandstone hills. These are formed of the more resistant Bundamba sandstone exposed in a fold, the western limb of which is continuous with the great West Ipswich fault already referred to as probably having determined the course of the Upper Brisbane. The range of hills may have resulted from a slow elevation with which the Teviot was able to keep pace in cutting down its bed, or as seems more probable, the hills are a result of differential denudation. Which ever is the correct explanation, the Teviot flows undisturbed across the line of earth movement which appears to have determined the position of the upper Brisbane.

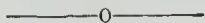
The Bremer also crosses this fault at Ipswich, passing from a wide alluvial valley into a narrow one between the hills of Ipswich.

The Logan River above the junction of the Teviot Brook is, in the region of Beaudesert, characterised by wide black soil alluvial flats, which are absent or much smaller lower down the river. Above Beaudesert the tributaries nearly all join from the west, the exception being Christmas Creek. The latter, with its branch, Widgee Creek, is roughly parallel with the heads of the Albert, and these with heads of the Canungra, Coomera, and Nerang. They all rise in and dissect into deep valleys and gorges, the basaltic plateau of the MacPherson Range. They run long, more or less parallel courses, separated by remnants of the plateau, though in

places the divides have been reduced to low gaps, as at Canungra.

These five streams, with their branches, rising close together, but gradually diverging, with the exception of the Albert and Canungra, keep separate courses to the sea, the Albert only joining the Logan at their combined estuary. Each stream exhibits varying characters in its course, associated with changes in the rock structure, but in their uppermost parts at least they evidently form one group of streams previously situated on the top of a basaltic plateau, but now in deep valleys of their own carving. Possibly a study of this group of streams may help us to form some idea of the former extent of the basalt.

There are other less notable features of our local streams of which mention might be made, but more would certainly weary (if you are not already fatigued). Enough has, I hope, been said to show that much information may be obtained, and not a little pleasure from their study.



BRISBANE BUTTERFLIES OF THE FAMILY PAPILIONIDAE.

A general account of these insects, as observed in the gardens and streets of Brisbane and its vicinity, with notes on food plants, both native and introduced.

(By R. Illidge.)

SERIES I.

These notes on the butterflies of the family Papilionidae are intended more for junior members of the F.N.C., but we hope also to interest others in these beautiful insects. They are figured separately, and treated popularly, the descriptions being made as short as possible, reliance being placed more on the plates for their identification. For those who desire a more advanced knowledge of our Australian butterflies, I cannot do better than refer them to "The Butterflies of Australia," by Waterhouse and Lyell. Herein an introduction of fourteen pages, containing a wonderful amount of information in short, terse sentences is given, followed by many of descriptions, illustrations, and classification of all the Australian butterflies, also notes upon collections and collecting. Most of the illustrations are from excellent photos, the balance consisting of several plates of figures accurately coloured.

Troides priamus richmondus*, Gray

Of all the butterflies of the Brisbane district this is the finest. The sexes are quite unlike, except in the general formation of the wings, the female being considerably larger, but wanting the rich colouration of the male. In the male the fore-wings are deep velvety black, with silky green sub-costal band from base almost to apex, and a very variable band, slender along dorsum, but expanding into spots at tornus, occasionally almost, if not quite absent. The hind wings are silky green, with somewhat variable black margins; a discal row of round black spots, and occasionally a sub-marginal row of bright yellow translucent spots. Sometimes these spots, both black and yellow, are greatly obscured, or quite absent, the wings then appearing uniform green, with black border only. The under-surface of both wings is black, without the velvety surface of the upper, and elegantly variegated, with bluish green streaks and spots, those towards the margins of the lower being golden yellow. The body is black on thorax, with a green streak, its under-sides being bright red; the abdomen bright yellow above, sides black. Antennae long and black.

The female is dull black, with grey spots and streaks on upper side of fore-wings, those on the hind wings being larger and arranged sub-marginally, more or less tinged with yellow, and having a black spot near centre. Body dusted yellow with sides of thorax beneath bright red.

This butterfly, now rarely seen about Brisbane, was by no means a rare species in the early days.

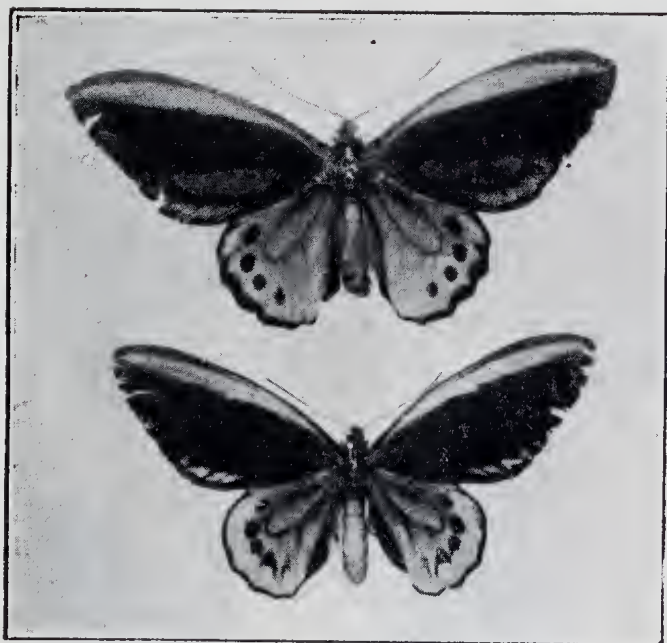
In the year 1870 it occurred in very great numbers in the streets of the town, and boys were chasing and capturing many. Of these, two male specimens are still in my possession, and in fair preservation, but of the females also taken at the same time, they were sold with my collection a few years ago. But few have been seen since those days, and then generally high up, quite out of reach of the net, though once at Bulimba a singular occurrence happened. As a female was passing over the garden, a bougainvillea in flower caught its attention, and

*Priamus.—King of Troy at time of its capture and destruction by the allied Greek armies. He was killed whilst in Sanctuary.

Richmondus.—This form so named because it was first taken on the Richmond River, in N.S.W., its southern limit.



Troides priamus richmondii, Gray. Three males. The upper one has sub-costal green band forked at apex ; four golden sub-marginal spots and one round and very small discal spot, black, next second golden spot. The central specimen has six sub-marginal golden spots and four velvety black discal spots, on each hind-wing—a very fine variety. Lower figure in resting position, but the crimson breast spot has not come out in photograph. Wing exp., $5\frac{1}{8}$ in.



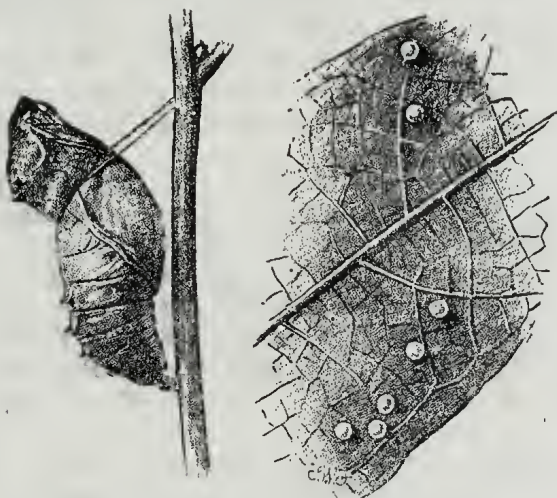
Troides priamus richmondus, Gray. Two males. The upper has four large black spots in each hind wing, and broad, irregular hind margins. Wing exp. nearly $5\frac{1}{4}$ in. This specimen was captured on North Quay in 1870. The lower fig shows four sub-marginal golden spots and five discal black spots of very irregular shape on the hind-wing, the base of which is strongly suffused with black. From the Blackall Range. Exp. $4\frac{3}{4}$ in.



Troides priamus richmondus, Gray; female.

Exp. of wings, 75 m.m. x 2=150 m.m.

though quite 50 feet or more above, it dropped perpendicularly on to this mass of bloom. Rushing inside I picked up my net, and in a minute or less it was secured. It was a poor specimen, but was kept as a trophy for some years. Since that time I have seen others, and on the 17th March, 1924, my son captured a female, and on the 4th April succeeding I got a male whilst it was probing the flowers of *Tecoma velutina*. However, we took during three succeeding years (1921, 1923, 1924), on the MacPherson Range over 200 specimens, about two-thirds being males. During an Easter trip of the F.N.C. to Tallebudgera a good many were observed over on Big Burleigh, in and about the little piece of scrub which adorns this headland. Coming nearer home they were



Troides priamus richmondii Ova and pupa.

(After H. Schneider in "The Entomologist," April, 1895).

formerly abundant at Nerang Creek, and also about Southport. In the Blackall Range, during the 1893 floods, they were observed in thousands on the blossoms of the bloodwood and other trees. We have taken them in the Gympie district, and had a specimen from Maryborough, which seems to be its northern range. In two visits to the Isis district, it was not seen, though further south in the Blackalls, it was strongly in evidence. As we have no records of its existence in the main Ranges it seems probable that this beautiful insect is confined to the coastal range jungles, including Tambourine Mountain and the country of a similar character eastward. Much of this country is familiar to us, but of N.S.W. Byron Bay is the

only place we have visited, and it undoubtedly is well-known there, though we did not see it, but Mr. A. Burns and others have taken it on the Richmond River, probably its southern limit.

The food plants is *Aristolochia pervenosa*, but in the dense jungle country it is not easy to find this plant. However, its curious flower will betray its presence to those who seek for it. Its ovum, larva, and pupa are now well-known, and have been described by Mr. H. Schneider in "The Entomologist," Vol. XXVIII, April, 1895, No. 383. Several times I obtained the pupae of the insect and watched the emergence (eedyssis) of the butterfly, both male and female, and as Mr. Schneider has noted, the pupae were not on the food plant, but on others not far distant. Its eggs are laid on the food plant. The larvae and pupae vary somewhat in colouration. Mr. Schneider has figured one pupa, as also the eggs on part of the leaf of the *Aristolochia*, showing the characteristic veining of the plant.

In its habits the butterfly is a bold and fearless creature, and will come and settle quite close, though if roughly disturbed it sails off very rapidly, usually obliquely upward. When settled during the day its wings are as usual in other papilios, not as in *P. aegaeus*.

On the mountains the imported Scotch thistle is a great attraction, but in other places, as at Big Burleigh, the flowers of lantana are a source of its nectarial pabulum.

The thistle lantana blackberry and other prickly plants prove very prejudicial to the appearance of the butterfly, and perfect specimens become so damaged and torn in a very short time after settling amongst these as to be useless to the collector.

They are amongst the earliest of butterflies to take wing, and the latest to seek shelter. A smart shower of rain does not greatly affect them, neither does a drizzling rain offer much disturbance to their daily routine of life. They are usually more easily captured than.

As with *P. anactus* they very often drop to the ground amongst small plants when attacked by the net of the collector, and upon his withdrawal of the net, thinking he has it therein, it quietly slips away, to his intense surprise. However, this habit is not confined to these two butterflies, but is frequently resorted to by other species. The safest way is to drop the net over the

insect if the situation allows such, holding up the end, and the butterfly or moth then flies upward, and with a rapid sweep and twist of the net it is secured.

Papilio Aegeus Aegeus, Donovan*

This is the largest of our local butterflies. It is sexually dimorphic. The male having been described as *P. eretheus* and female *P. aegeus* by one of our earlier naturalists, the latter name takes precedence as being first.

The figures on the plates give a good general idea of its markings. The fore-wings of male are black, with white incisions, and a sub-apical band of white spots with slight creamy tinge. Hind wings also black, with white incisions, and a large central row of creamy white spots, divided by the nervures into six segments. There is also a tornal spot of bright orange red, more or less blue scaled above. The under-side is brighter as regards colour, being ornamented with a sub-marginal row of bright red spots followed by another of shining blue, more or less crescentic in shape, and again by a similar row of shining grey-green spots; all these are very variable in size and colour, being sometimes very bright and distinct in some specimens; in others indistinct and wanting in rich colour, the orange, for instance, being dull, brickly red. The white sub-apical band of upper surface in fore-wings is reproduced, but the discal patch of hind-wings is absent. But the chief beauty of the male is on the upper surface, which in perfect specimens is of an intense black, dusted all over with shining steely blue scales. In others the black is thickly sprinkled with coppery brown scales, especially along the nervures. The greater part of under-side is black, with blue gloss.

The general colour of forewings in female is brownish at base and grey apically, but the latter sharply defined by the nervures, which are of same hue as the base; the apex of cell has a large, irregular spot of grey. The hind wings are basally brown, but towards margins are broadly black with incisions white tinged more or less with ochreous. Then follows a sub-marginal row of seven bright red lunate spots and a discal of four or more shining blue. A large, irregular white spot occupies the centre of disk, reaching dorsum, above red tornal spot. The

*Aegeus.—King of Athens, after whom the Aegean Sea is said to have been named; lived some 1200 years B.C.

under-surface is similar to upper, but somewhat brighter, and with markings considerably larger.

Both males and females very much in size, colour, and intensity of markings, especially in female. The male specimen figured is a large one, and well-marked; the female is only of medium size, but has the orange red spots of the hind wing well developed, though occasionally specimens may be bred or captured with the orange red spots and blue lunules much larger and more brilliant. Again, perfect specimens are sometimes no larger than *Papilio anactus*, with markings quite dull and obscure, the bright orange red being brick red, and blue lunules nearly, or quite, absent.

The butterfly is frequently abundant, sometimes exceedingly so. In 1923 they were plentiful, and in 1924-5, during most of the summer, they were in swarms all round Brisbane. Children captured great numbers by knocking them down with their hats, bushes, etc., and putting them not quite dead into card-board boxes, in a much mutilated state. The males outnumbered females greatly at first, but towards the end of the season this was reversed. At dusk and early morning they were settled in various corners and under bushes in shady places, usually sheltered from wind. Their method of resting is quite different to that of our other papilios, the fore-wings being bent down overlap the hind-wings, except the tornal red spot, which is always exposed. Most other butterflies rest with their wings reversed perpendicularly over their backs, the upper surface being quite hidden.

The food of the larva in its wild state consists of the foliage of various Rutaceae, as *Acronychia* and *Halfordia*, also citrus (the wild lime or orange), and probably *Atalantia*, the inland lime. The introduced orchard fruit trees (orange, lime, lemon, and citron) are also much infested, but the butterfly is kept in check by various birds, like the silver-eye, various tits, etc., etc., which pick off the ova as soon as laid. These birds (the silver-eye, especially, is valuable to the orchardist, for it appears to exist largely on the eggs of many insects), quite cleared the trees of the ova of this papilio after the great swarms previously mentioned.

The whampee (*Clausena wampi*) a fruit introduced from China, and also of the orange tribe, is occasionally affected, and some years back I bred out a batch of very fine and large specimens of this butterfly from larvae I found feeding on its leaves.



Upper figure :

Papilio aegeus aegeus, Donovan ; male.

Exp. 70 m.m. x 2 = 140 m.m.

Lower figure :

Papilio aegeus aegeus, Donovan ; female.

Exp. 71 m.m. x 2 = 142 m.m.





Papilio aegus aegus of Donovan ; male.

 Exp. of wings, 60 m.m. x 2 = 120 m.m. Resting position.



Papilio fuscus capaneus, Westwood ; male.

Exp. of wings. 50 m.m. x 2 = 4in.

Female has similar markings but is larger.

[Faint handwritten notes]

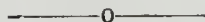
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Amongst parasites which attack larva and pupa, also ovum, are various Hymenoptera Diptera, etc., but these are not within the scope of this paper.

Papilio fuscus capaneus* Westwood

This is a rare species about Brisbane, though quite a fair number has been taken at Bulimba. Some few years ago I saw a specimen flying leisurely up Queen Street and into the garden, where now stands the Union Bank. Though not so bright as *P. aegeus* its spatulate tails give it a more elegant appearance. In colouration it is mostly coppery brown, with a band of creamy white spots diminishing towards dorsum on forewing. The hind-wing has a large discal band, as in figure, of a creamy white, a red tornal spot and sub-terminal spots of orange and blue. Beneath it is similar in colour and markings. Both wings above have white incisions, more distinct along the hinder wings, and in fore-wings are rayed by darker brown along the nervures.

Though rare about Brisbane, we found this insect quite common at Yeppoon, one of the Rockhampton beautiful watering places, in October, but did not attempt to capture any. The butterfly is found throughout the Queensland coastal districts, rarely reaching the other side of the ranges, but has been taken by us at Killarney. Its food plants are as in *P. aegeus*. The larva is marked like that of *P. aegeus*, but is quite distinct in form, as also is the pupa. Several larvae were taken on the foliage of a mandarin orange in our garden, but only one specimen emerged perfect, the rest being parasitised by a fly.



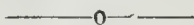
BIRD PROTECTION.

It is pleasing to learn from the recently issued Bulletin of the International Committee for Bird Protection of the election of Mr. G. H. Barker and Mrs. W. M. Mayo as Queensland representatives on the International Committee. The committee is the direct result of a meeting held at the home of Mr. Reginald McKenna, London, in June, 1922. The meeting was presided over by Dr. T. Gilbert Pearson, of America, and after free discussion it developed that it was the unanimous decision of all present that the creation of an International Committee

**Capaneus*, a noble Argive killed by a thunderbolt during the Theban War.

for Bird Protection would be a wise course to pursue. The Chairman stated he did not immediately expect to have an active, flourishing section in each country, but the plan was to have sufficient interest to get the Committee together on matters relating to the more important phases of international bird protection, and also by the printing of an occasional report acquaint the people with what is being done in countries other than their own.

The Bulletin just issued by the Committee contains accounts of the present state of bird protection in Australia, Austria, Canada, France, Germany, Great Britain, Holland, Hungary, Italy, Norway, South Africa, Sweden, Switzerland, and the United States of America. The accounts are contributed by well-known ornithologists of the respective countries.



OBITUARY.

Members of the Queensland Naturalists' Club will learn with regret of the death of Dr. F. Hamilton Kenny at his residence, at Crow's Nest, on the 5th May. The late Dr. Kenny, who was 67 years of age, was born in Norfolk (England), graduated in medicine at the Royal College of Surgeons, London, and came to Victoria as a young man, where he started private practice. He also spent some time in Western Australia before coming to Queensland. During a visit to Gympie in 1907 members of the Club were entertained by Dr. and Mrs. Kenny, he being at that time Superintendent of the Gympie Hospital. He was a keen all-round naturalist, and a genuine lover of nature. Not long before his death he wrote me that all nature had always given him a distinct thrill of pleasure. His first studies in natural history in Australia were with birds, and he made a fine collection of skins, which he donated to the Queensland Museum. In later years he still retained an active interest in bird life, and wrote a very readable account of the birds of the Gayndah district, which was printed in this magazine for July, 1915. Plants, however, claimed his chief interest, and he was one of the best amateur botanists in the State. During the war he served as a Lieutenant-Surgeon in the Australian navy, and while on active service in New Guinea sent a paper on the natural history around Rabaul. This was read at one of the Club's meetings, but was not published.

C. T. WHITE.

The Queensland Naturalist.

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No. 3.

PROCEEDINGS.

EVENING MEETING, 15th MAY, 1927. The President (Mr. D. A. Herbert, M.Sc.) in the chair. Misses Benzie, Clarke, Grimes, and Wegner, and Mr. Jackson were elected members. In an interesting account of the excursion to Enoggera, Mr. R. Illidge said that insects except butterflies were not plentiful, though dragon flies made a fair show, and two fine beetles were taken. Specimens of beetles from this locality were exhibited by Mr. Illidge. Mr. J. H. Simmonds, M.Sc., gave an interesting lecturette on "Some of the Moreton Bay Anemones and their Allies," illustrating his remarks with diagrams and specimens of various forms. Specimens of anemones, coral from Cleveland and Dunwich, and sea pens, were also shown. Several members contributed remarks on the subject. Other interesting exhibits by members included a spray of mistletoe, by Dr. Comyn; shells of fresh water mussel and tortoise eggs from the Albert River, by Mr. J. C. Smith; a moth from Cooktown, by Mr. Moller; dragon flies, by Mr. Franzen; microscopical slides, by Mr. Gillet; noctuid caterpillars, and an exhibit showing the beautiful butterfly, *Papilio joesa*, in various stages of growth.

EVENING MEETING, 20th JUNE, 1927. "The influence of the Sun on the Weather," was the subject on which Mr. Inigo Jones, the well-known Queensland meteorologist, lectured before members at this monthly meeting. The point which the lecturer brought before his hearers was that, although the sun was known to influence the weather, it appeared in exactly the same position season by season. He showed by the aid of slides that the spots on the sun, although sometimes similar, were never the same as previously. Another point on which he discoursed was the physical effect of the planets on the sun. It was highly probable that the crossing of the

sun's path by the planets, as the sun moved north, absorbed the sun's magnetic constancy. As these constancies could be calculated for years ahead it was probable that when they were correlated we would have another exact means of gauging the weather. Unfortunately exact data was lacking, for when observations were being made in the past their significance was not realised, and no records were kept with that end in view. The lecturer illustrated his address with slides. The president of the club (Mr. D. A. Herbert) presided.

EVENING MEETING, 18th JULY, 1927. A brief account of the evolutionary history of the oyster was given by Dr. Whitehouse, showing how the many different genera of oysters were produced along definite evolutionary trends. The oyster illustrates very well the theory of Orthogenesis, which is the main contribution of palaeontology to the theory of evolution. The lecturer concluded by showing how the theory would explain the many puzzling anomalies of different groups of the animal kingdom, even including the origin of man.

OPEN SEASON FOR THE KOALA OR NATIVE BEAR.

The decision of the Government to declare an open season for one month for the native bear, from August 1st, brought forth a good deal of discussion. Mr. G. H. Barker (State Secretary, Royal Australasian Ornithologists' Union) moved that the following resolution should be presented to the Government:—"That the Queensland Naturalists' Club, together with the Nature Lovers' League, views with the utmost abhorrence the action of the Queensland Government in allowing an open season to be declared next August for Queensland's harmless, helpless, and much-loved native bear, and implores the Minister, before it is too late, to reconsider the position, and withdraw the proclamation."

Mrs. W. M. Mayo seconded, and the motion was carried unanimously. It was also decided to draw up a deputation of representatives of the various sections of animal lovers to urge the Minister to withdraw the declaration.

Mr. Barker said that the matter was one of great urgency. He was gravely of the opinion that if the season was opened in August next it would mean the end of the native bear. Thanks were due to the Press

PLATE I.



FEMALE KOALA, WITH YOUNG.

[Photo, W. G. & R. C. Harvey, Mackay

for the lead it had given in bringing the matter before the public. He noticed that the Acting Premier (Mr. W. Forgan Smith) was trying to justify his stand, and said that bushmen and rangers advised that the bear and 'possum in many districts were plentiful. This statement, said Mr. Barker, according to information he had received from bushmen, and from his own personal knowledge, was incorrect. The native bear was practically extinct in most districts in the State. It did not breed or increase as did the 'possum, and another factor that was tending to destroy the bear was that trappers and others did not seem to care whether the season was open or not. They trapped them all the year round, with the sure knowledge that the Government would sooner or later declare an open season, and they would then be able to get rid of their skins.

Mr. Heber A. Longman (Director of the Museum) observed that the preservation of the native bears was a matter in which the whole of the scientific world was concerned.

The Koala or native bear, he said, was not only one of the most interesting of our marsupials, but it was recognised by scientists as one of the most remarkable animals of the whole world. Unlike kangaroos, wallabies, wombats, and 'possums, the Koala was represented by a single species only. It stood alone, without close allies, as a survivor of the richer fauna of the past. It possessed so many special characters that the highest authorities now placed it in a distinct sub-family of its own. At one time it was included with the common 'possum and the "ringtails" in the family Phalangeride, but in several respects it differed greatly from those arboreal marsupials. The absence of an external tail was an obvious distinction. Instead of possessing a typical bag-like pouch, which opened forward as in kangaroos and 'possums, the Koala had a pouch which was widely extended at the sides, and which opened backwards. It also differed from the 'possums in having the fore and hind feet of practically equal size. On either side of the upper jaw the Koala had a curious structure known as a cheek-pouch. The cavity served to retain portions of masticated food, which were subsequently digested. No other living marsupial had a cheek-pouch of this type, but in the opinion of the speaker it was present in some of the gigantic marsupials of the past.

Unfortunately, the native bear was not so widely distributed as most of our marsupials. It was absent from the far north and far west of Queensland, and was not found in Tasmania, South and West Australia. As it lives in the open forest, it was not likely to secure much protection in our sanctuaries, which largely consisted of rich scrub country.

"The Koala is a unique product of the Australian bush, and is one of the most specialised of our marsupials," declared Mr. Longman. "Its quaintness and in-offensiveness have gained for it the love of all Australian children. The civilised nations of the world treasured the works of great artists, and none but vandals or barbarians would destroy great paintings or fine statues. In one respect, nature's artistry is even more valuable, for when once a rare bird or mammal has been exterminated, not all the wealth or genius of the world can replace it. The people of Australia have a unique heritage in their remarkable fauna, and they are under a special obligation to preserve it for posterity."

Capt. S. A. White, the well-known South Australian naturalist, who chanced to be in Brisbane at the time, confessed to being rather startled and horrified when he read, on his way to Brisbane, of the intention of the Government to declare an open season for native bears. "There is not the slightest doubt," he said, "that once any form of animal life is reduced to a certain number it 'passes' out as quickly as possible—it disappears, and it is useless to try to stop such disappearance." He observed that eight species of birds had disappeared in South Australia during his lifetime. If the Queensland Government opened the season for native bears, he continued, there was not the slightest doubt that they would lose the bear in Australia. Not only would Australia be condemned for not having the forethought to preserve this animal life, but it would mean a very great loss to the scientific world. He hoped that the Government would close the season for bears permanently.

Following the meeting a deputation of representatives of the Queensland Naturalists' Club and other scientific bodies waited on the Acting Premier (Mr. A. J. Jones), but in spite of the strong case put forward, and State-wide protests from all classes of the community, the Cabinet, after two meetings, in which the members re-

viewed the whole question and considered the multitude of protestations, decided not to rescind the proclamation of an open season from August 1st to 31st inclusively.

It is certain that the open season made a heavy toll on the bear, and efforts are now being made to induce the Government to have the bear protected for all time. It is certainly only by strenuous efforts that this interesting and unique animal will be preserved to posterity. Fortunately the great bulk of public sympathy is behind naturalists and scientists in this matter.

EVENING MEETING, 15th AUGUST, 1927. Dr. E. O. Marks occupied the chair, and there was a good attendance of members and visitors. Interesting reports on the excursion to Sunnybank were given by Dr. E. O. Marks (geology), Mr. G. H. Barker (ornithology), and Mr. C. T. White (botany). A very beautiful collection of shells was staged by Mr. J. H. Simmonds, senr. The exhibit was commented on by Mr. H. A. Longman and Mr. J. H. Simmonds, junr. A peculiar web from Sunnybank, staged by Mr. Barker, was described by Mr. Franzen as a web formed by processional caterpillars. Mr. F. B. Coleman exhibited a fine specimen of a marine bristle worm from Stradbroke Island. Mr. G. H. Barker exhibited several books to show the high class of work it was now possible to turn out in Australia. A specimen of *Bryophyllum calycinum*, the "Live-for-ever" plant, was tabled by Mr. Nixon.

WILD FLOWER SHOW and GENERAL NATURAL HISTORY EXHIBITION, SATURDAY AFTERNOON and EVENING, 3rd SEPTEMBER, 1927. The exhibition was officially opened by the Mayor of Brisbane (Ald. W. A. Jolly) at 3 p.m. The exhibition has now come to be looked forward to every year by the public, as shown by the fact that several hundred people always visit it during the afternoon and evening.

There was a very fine display this year of wildflowers from different parts of the State, though the railway strike prevented several country centres sending flowers by rail. Possibly this accounted for the very few entries for the school competitions. Prizes in this section were awarded as follows:—North Coast: Caloundra 1, Lagoon Pocket 2. Granite Belt: Thulimbah 1.

Special tables of flowers from the Albert River were staged by Mrs. S. and Mr. and Mrs. D. Curtis; from Tambourine Mountain by Mr. and Mrs. Herbert Curtis; from Caloundra and Moreton Bay, by Mr. and Mrs. W. M. Mayo; and from Amity Point, Stradbroke Island, by Mr. T. and Miss Welsby. Specimen collections of flowers were staged by Mr. Mitchell (Bribie Island), Mr. Shirley (Bribie Island), Miss Rose Davies (Bribie Is.), Mrs. Saltmarsh (Southport), Miss Mabel Birt (Molendinar), Mrs. Nebe (Mount Gravatt), Mr. C. T. White (Sunnybank), Mrs. Nicholson (The Blunder), Mrs. Slaughter (Thulimbah), and Miss Murphy and Mrs. W. Hooper.

Interstate exhibits were wild flowers from Western Australia, sent by Lieut.-Col. Goadby, and from Victoria, sent by the Field Naturalists' Club of Victoria. Flowers from New South Wales arrived too late for staging.

Specimens of West Australian plants grown in Brisbane, including the Geraldton Wax Flower (*Chamaelaucium*) and *Eucalyptus megacarpa*, were shown by Mr. E. W. Bick (Botanic Gardens), Mr. J. C. Brunnich, Mrs. Clark, and Mrs. Stafford. A fine specimen or two of the cone of *Macrozamia Denisonii* was staged by Mr. and Mrs. H. Curtis.

In the photographic section photographs of wild life, mostly birds and flowers, were shown by Mrs. H. Curtis, and Messrs. Gaukrodger, Otho Webb, R. L. Higgins, Robinson, and W. G. and R. C. Harvey (Mackay). A large case of coloured entomological drawings by Mrs. Trenow was also shown.

In the entomological section cases of Queensland butterflies were staged by Messrs. Moller, R. Illidge, and D. Curtis. A beautiful collection of Queensland shells was shown by Mr. J. H. Simmonds, senr. A number of specimens under the microscope, shown and explained by Mr. Gillett, were the source of much interest.

The thanks of the Committee are due to the Botanic Gardens for the loan of pot plants, to the University for the loan of trestles, to the Horticultural Society for the loan of vases, and to the several ladies and gentlemen who helped in arranging flowers, etc.

BRISBANE BUTTERFLIES OF THE FAMILY PAPILIONIDAE.

(By R. Illidge.)

SERIES II.

Papilio sarpedon choredon, Felder.

This wide ranging butterfly is found from N.S. Wales as far north as Japan, with a westerly expansion through Malay Archipelago and Peninsula to N. India. Our form differs but little from the Indian; the latter in specimens received from Assam has the blue-green triangular area slightly narrower.

Its earliest appearance on the wing is in September, and from that time onward to end of April it is usually more or less abundant. It is a very beautiful insect, deep glossy brownish black with broad oblique blue-green bands triangular in shape, hence the common name of "The Blue Triangle." The bands are broken into spots by the nervures,* the lower wings having in addition sub-marginal rows of blue lunate spots, and a short tail-like process. The under surface is varied with red. It is the commonest of the papilios seen in the gardens of Brisbane, especially where the camphor laurel is grown, and is frequently seen in the principal streets of the city.

Being a very active creature, it is not easily captured, and specimens bred from the caterpillar found on the camphor laurel very rarely if ever attain the rich hues of the butterfly born in the sunshine of the open and free to roam at large unrestricted. It is easy to obtain, however, after sunset in gardens facing the setting sun and sheltered from winds. Here they come to rest for the night and may be caught with the fingers or in a net with little trouble. In the early mornings the larvae may be discovered on the trees by the slight snapping sound made by the mandibles whilst feeding on the leaves.

The original native food plant of this butterfly is very obscure. The camphor laurel, as before-mentioned, is an introduced plant, and in Queensland was spread from our Botanic Gardens as an ornamental tree, and as such proved its value. However, in the early sixties as a boy *Sarpedon* was a favourite object of pursuit, and was abun-

*Most of these nervures between the bands are whitish in colour, but the three or four apical spots are quite distinct.

dant at Kelvin Grove and all along the Ithaca Creek branches of Enoggera Creek. Later on at Gympie, in 1870, it was equally plentiful, and on my first visit to the Isis it was scarcely possible for anybody not to notice their numbers. The introduced camphor laurel was not then grown at any of these districts. On the North Quay, Brisbane, it was quite frequently to be seen settling on the lantana blossoms, where this plant spread from the Botanic Gardens, and thence over all South Queensland, being carried chiefly by birds, which passed the seeds in a fit state for germination.

The butterfly larva certainly did not feed on the lantana leaves, though the butterfly itself sucked the juices (nectar) from the flowers. Many butterflies will fly down on to roads and tracks to imbibe filth from mud, ordure, etc., and this species is not exempt. Others again will get quite intoxicated from the fermenting sap of trees, also fallen fruits.

In Japan the food plant is **Maehilus thunbergii*, and there it is abundant from April throughout their summer.

***Papilio eurypylus lycaon*, Westwood.**

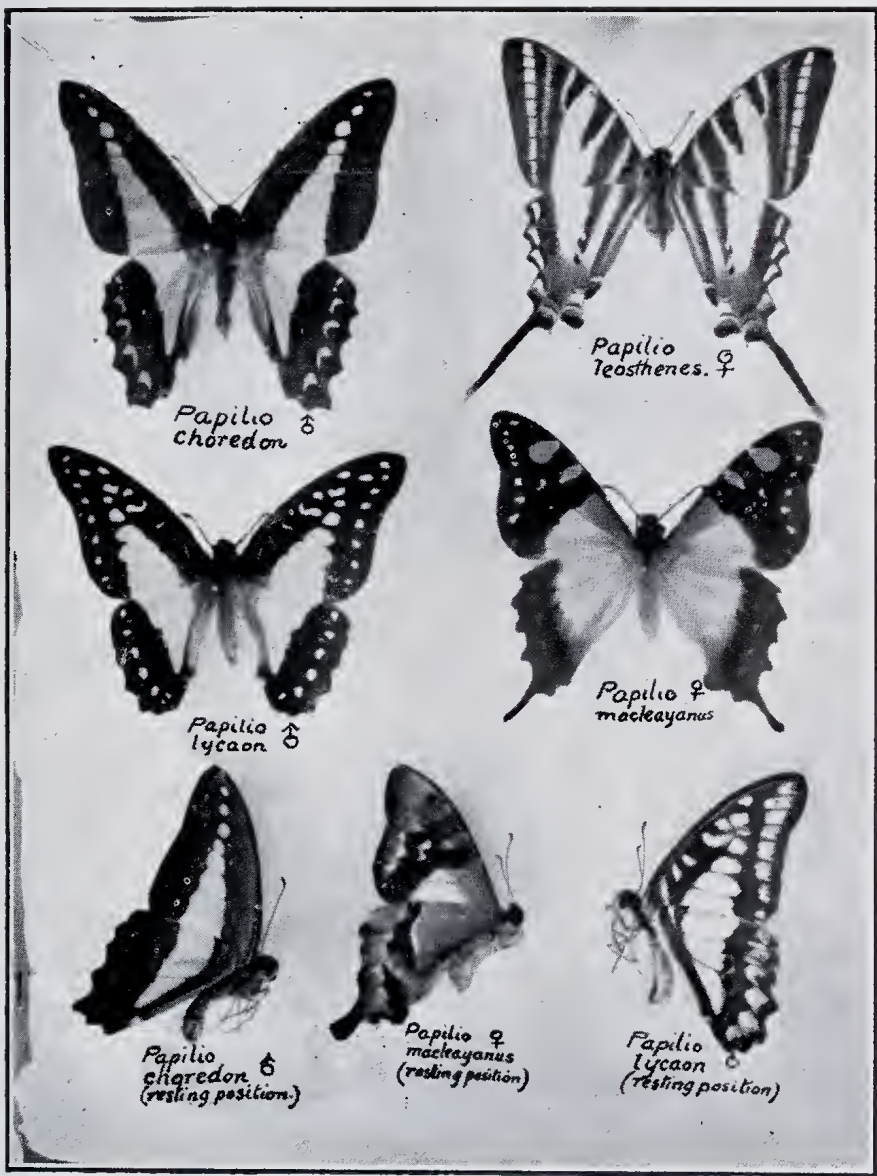
This handsome butterfly is equally as abundant and has almost the same range of distribution as *P. sarpedon*, though it does not, as in that species, reach Japan. The upper surface of the wings is variegated by bands and spots of pale blue on a dark ground. The under parts are shining silvery blue relieved by red spots or lines on the hind wings. The larvae feed on various anonaceous plants, and have largely taken to the introduced custard apple. As in *P. sarpedon* they need the bright sun and an active life to attain full beauty of colouration, so that breeding the larvae gives poor results, the butterflies so obtained having a sickly hue. It is not seen so commonly in our streets as *Sarpedon*, but any garden possessing a custard apple tree is sure to attract it freely.

There is an ochreous-yellow form of this species occasionally to be seen here, probably an aberration or variety only.

**Rhopalocera Nihonica*, Pryer.

Papilio, a butterfly; *Sarpedon*, son of Jupiter by Europa, the daughter of Agenor, assisted Troy against Greece; was finally slain after many valorous deeds. *Choredon* not known, possibly intended for *Corydon*, name of a shepherd used in the pastoral poems of Virgil and Theocritus,

PLATE II.



BRISBANE BUTTERFLIES
(about one-half natural size).

[Photo by J. C. Smith.



Both this species and the preceding "Blue Triangle" butterfly are beautiful fairy creatures in our gardens. Ever restless they flit up in rapid evolutions over the tops of the trees then down again through every sunny glade, stopping often at some flowering plant to obtain, with quivering wings, a sip of neectar. Or they dart off in chase of one another, performing all sorts of acrobatic feats. Hot gleamy days with occasional showers are their especial delight.

***Papilio macleayanus*, Leach.**

The butterfly known under this name is confined to Eastern Australia and Tasmania. It is a spatulate tailed species having base of wings green, outwardly shaded with grey more or less tinged with green, the apical area being black with two large green spots along costa and a comma-like spot beneath these, also a sub-marginal row of small green spots. The lower wings are basally grey-green, and outwardly blackish, the incisions white bordered. Beneath the wings are brighter green edged silvery, the two large green costal spots as on upper surface, but the remainder of the under being soft shades of brown edged silvery-grey—a chaste arrangement of colour.

It is not by any means a common butterfly around Brisbane, as its native food plant has been so much destroyed by the march of settlement, and it has not taken so kindly to the introduced Laurinae and Rutaceae, like *P. sarpedon*. We have, however, often taken it at Bulimba about the camphor laurels.

The insect is quite common on the Blackall and Macpherson Ranges, also Main Range. On the summit of Wilson's Peak* in December, 1903, it, in company with *Pap. Sarpedon*, *Lycæon*, and other butterflies, was surprisingly plentiful. At the Blackall Range the blossoms of the orange and other sweet-scented flowers are very attractive to it. It has not, so far as I am aware, been taken in larval state on the orange or lemon. Some years

Eurypylus, a noted Trojan chief in the war between Greece and Troy, slain by Pyrrhus, son of Achilles.

Lycæon, a son of Priam and Laothoe, killed by Achilles in the Trojan war.

*4,100ft. At angle of Main and Macpherson Ranges, head of Teviot Brook, Condamine River (Qld.), and head waters of Clarence River, in N.S.W.

Macleayanus, after Macleay, a noted naturalist.

ago, however, an old naturalist named Batchelor, brought me a number of larvae and pupae of this butterfly, which I duly hatched out, but as usual none exhibited the bright hues of the insect born under natural conditions, being ochreous-yellow, and scarcely having a trace of green.

***Papilio leosthenes*, Doubleday.**

This species is, like *P. macleayanus*, another Australian form, but has a restricted range from Richmond River to Cape York. The tails of this butterfly are long and narrow, never spatulate. Its larvae are found on *Melodorum leichhardtii*, a very large rambling climber, common in scrubs. The pupae are brilliant translucent green, quite exposed to attacks of birds, as they stand out in full view like buds, and could be easily picked off. It may probably be distasteful to the birds, otherwise it seems scarcely possible that the species could survive. As the butterfly is sometimes not uncommon about Brisbane, its caterpillars must find sustenance on other anonaceae or related orders. The colours are simple, being whitish with longitudinal dark bands as in the figure. In fresh specimens the base of both wings is stained with pale green, which gives the insect a very beautiful appearance. The flight of the butterfly is quick and graceful; its tails streaming out behind in an elegant manner appear to impart a steadying action.

—o—

**EXCURSION TO SUNNYBANK, 13/8/1927—REPORT
ON ORNITHOLOGY.**

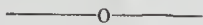
(By G. H. Barker.)

From an outing point of view, the weather was ideal, a clear bright day with no wind. The countryside was a picture of golden wattle, but no flowering Eucalypts were noticed, however, with all these ideal conditions. Bird life was disappointing, not more than two dozen species being noted for the ramble.

The most noteworthy event for the afternoon was the discovery at a very muddy waterhole of several sanguinous honey-eaters or blood birds. Nothing had been heard of this cherry little chap until arriving at this waterhole. One was flushed into a nearby tree, and he

immediately started his tinkling little note to be answered by several other birds in trees close by. On our return some hours later two of these little red-headed birds were discovered at this same waterhole. The bird most in evidence during the afternoon was the rufous whistler, pairs of which bird were scattered through the bush as we passed.

Appended is a list of species noted:—*Harmonius* thrush; rufous whistler, yellow-cheeked honey-eater, white shafted fantail, silver eye, yellow robin, black-headed pardalote, white-browed tree-creeper, blood bird, leather head, white-naped honey-eater, wagtail, graceful dove, singing flyeater (*Gerygone*), magpie lark, grey butcher bird, stumper or Jacky Winter, crow, red browed finch, *graucalus*, wren (? species), welcome swallow, straw-necked ibis, and magpie.



MIMICRY AMONGST BIRDS.

(By Mrs. W. M. Mayo, R.A.O.U.)

A few years back we (my husband and self) were sitting quietly on a fallen log at Wongawallen, on Stradbroke Island, Moreton Bay, when a grey thrush in a small gum tree close beside us sang a stave or two from her repertoire, ending on a high ringing note. Immediately the notes were repeated from another small tree about twenty yards away, but the singer cracked on the top note, and made a mess of it. The thrush went carefully through the song again, and the unseen singer tried it over just as carefully, still cracking in a most laughable way on the top note. The field glasses showed us a butcher bird as the second minstrel. Evidently the thrush was giving a singing lesson, but try as he might the butcher bird could not get that top note, though he managed the rest of the song splendidly. Both birds were very much in earnest, and went over and over the one thing until our laughter at the ludicrous break in the butcher bird's rendering frightened both singers away.

In July, 1924, Mr. Lloyd Rees, my husband, and self were anchored up the Brisbane River. The northern bank of the river was high and thickly covered with

lantana scrub, affording splendid cover for the coach whip birds, their resounding notes ringing all day long. The rufous and harmonious shrike thrushes—golden and rufous whistlers, yellow and scarlet robins, and a whole host of other species were wintering among the river valleys. The medley of sound often set me wondering whether each bird was not trying to mimic its neighbour as well as sing its own song.

One day while sitting at lunch on board the boat we listened to whip-bird, thrush, and rufous whistler—each bird in rotation, with hardly a stop between the different the different songs. The whistler seemed trying, in a thin, quavering voice, to imitate the whip-bird's song. The thrush tried too, certainly making a better and firmer job of it. Then, as if in derision at their efforts, so feeble and unconvincing, the whip bird's rich notes rang out, showing thrush and whistler how their songs should be sung—ending up with his own. We were fascinated as we listened; and laughed at the obvious mimicry. I took the dinghy and rowed over to the birds. A thrush and whistler flew as I reached the shore, but their songs still rang out as I landed and crept into a small cleared space adjacent to a clump of lantana; and saw a coach whip-bird half-a-dozen yards away. The bird was dancing up and down a log—so “beside” himself with mischief that he took no notice of me. I watched him as he mimicked the song of thrush and whistler, and then mimicked their mimicry of his own song, always using thin, quavering notes for the whistlers' imitation, ending with a most absurd doddery whip crack. Then giving the thing in his own rich, swelling notes as they should be. The whistler's long pe, pe, pe. pe, pe, pe (ad infinitum—usually given before a storm) the whip-bird gave to perfection. I clapped vigorously (I couldn't help it), and the little genius, with a scared look round, darted away into the lantana clump. The performance lasted half-an-hour, and was well worth the scolding I got for holding the boat up. Since then I have heard the lyre bird in the MacPherson Range, as it mimicked kookaburras, currawongs, rifle birds, fruit pigeons, and a host of other birds, and I thought perhaps it was not so much amusing itself as giving a star performance to all the birds in the mountain gully. And I imagined the birds perched sedately in the trees round “listening in” critically, while they appraised the lyre bird's reproduction of their songs

The Queensland Naturalist.

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PROCEEDINGS.

EVENING MEETING, 17th OCTOBER, 1927. The President (Mr. D. A. Herbert) occupied the chair. Mrs. Preston Day and Mrs. Corrie Smith were elected members of the Club. Native Bear.—Mr. G. H. Barker moved: "That the time is now opportune to move in the direction of having the Native Bear totally protected, and that all interested bodies be asked to join in a deputation to the Minister controlling the Native Animals and Birds Protection Act, with the above object in view." The motion was seconded by Mrs. W. M. Mayo, and carried unanimously. Mr. R. Illidge exhibited stuffed specimens of the Regent Bird to show the differences in the plumage of the male, female, and young birds; also specimens of the Yellow-eared Honeyeaters, once common around Brisbane. The specimens exhibited were obtained more than forty years ago, and were in an excellent state of preservation. Mr. H. Tryon exhibited specimens of (1) *Dactylopius aurilanus*, an insect destructive to Bunya Pine (*Araucaria Bidwillii*); (2) *Cryptolaemus montrouzieri*, predatory on the *Dactylopius*; (3) *Xylopsocus gibbicollis*, a timber borer (Family Bostrychidae), that bored into lead and destroyed the insulation of telephone wires, etc.; and (4) specimens from Inverell, N.S. Wales, of the so-called "Vegetable Caterpillars," i.e., caterpillars infected by the sclerotium of a fungus of the genus *Cordyceps*. A number of lantern slides of bird photographs by Mr. D. W. Gaukrodger were screened. In the unavoidable absence of Mr. Gaukrodger, the pictures were explained by Mr. G. H. Barker.

EVENING MEETING, 21st NOVEMBER, 1927. The President (Mr. D. A. Herbert) occupied the chair. A letter was read from Mr. E. Sutton, Broadwater, Stanthorpe, asking if any members would exchange beetles with him. Reports on the excursions to Chermside and

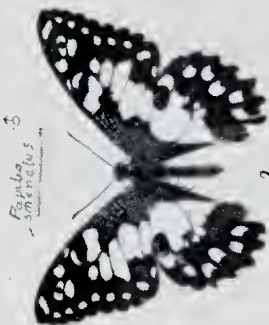
to Kuraby were given by Mr. D. A. Herbert (botany), and on the excursion to the Upper Albert River by Mr. R. Illidge (entomology), and Mr. Barnard (ornithology). Mr. R. Illidge exhibited (1) specimens of the native Liliaceous plant, *Dianella caerulea*, from his garden; (2) *Dendrobium cucumerinum* (cucumber orchid) from Kileoy Creek; (3) very large specimen of the butterfly *Papilio aegeus*, the largest local specimen he had seen, having a wing expanse of 152mm., the specimen was sent him by Mr. J. W. Adams, Bribie Island; (4) male and female specimens of the very pretty Quandong Butterfly (*Deudorix diovis*), the larvae feed on the young quandong (*Elaeocarpus*) seeds, also *Cupania* seeds, etc.; (5) specimens of the butterfly *Phaenicopts beata*; (6) specimens of *Cryptophasa flavo-lineata*, a xyloryct moth found tunnelling the stems of the small guava (*Psidium*); (7) *Xylorycta helio-macula*, a xyloryct which affects the mistletoe—its larvae boring the main stems, usually at the nodes; (8) various Coleoptera, from Tambourine Mt., mostly collected by Mr. D. Curtis. Miscellaneous exhibits were staged as follows.—By Dr. E. O. Marks, geological specimens from Woodridge; by Mr. J. H. Simmonds, specimens of sea-worms; by Mr. D. A. Herbert, yellow everlasting (*Helichrysum bracteatum*), from his garden, also a plant of *Myrmecodia* sp., a myrmecophilous plant, the tunnellings in the swollen stem of which act as housing places or nests for ants; by Mr. R. Higgins, specimens of *Eugenia* sp. in flower, from the Pine River, and of Christmas Bells (*Blandfordia*) from Caloundra; by Mr. J. E. Young, miscellaneous specimens, including a piece of sandstone from the Great Pyramids, peat from Scotland, and specimens of European wildflowers, also specimen of stone-like porous material (unidentified), from Point Lookout, Stradbroke Island; and by Mrs. W. M. Mayo, a trap-door spider's nest; a collection of water-colour paintings of Brisbane wild-flowers, by Mrs. Aubrey Thomson, was much admired.

ANNUAL MEETING, 27th FEBRUARY, 1928. The President (Mr. D. A. Herbert) presided over an attendance of 33 members. Miss Barnard, Mr. M. A. Cameron, and Mr. A. Stokes were elected members of the Club. The annual report of the Council was read and adopted. The financial statement as read by the Hon. Treasurer showed a credit balance of £30/9/-. Office bearers for the ensuing year were elected as set forth on the cover page of this issue. An address was delivered by the

Eurygus ♀
cressida



3



Papilio ♂
sphenelus

2



Papilio ♂
sphenelus

1



Papilio ♂
sphenelus

6



Eurygus ♂
cressida
underside

5



Eurygus ♂
cressida

4

retiring president (Mr. D. A. Herbert), who took for the scientific portion of his address a talk on "The Sun and Plant Distribution." A specimen of a very large moth (*Xyleutes Boisduvalii*) from Tambourine Mountain was shown by Mr. D. Curtis.

EVENING MEETING, 19th MARCH, 1928. The President (Mr. J. E. Young) occupied the chair. Mrs. Aubrey Thompson and Mrs. B. Young were elected members of the Club. Reports on the recent excursion to One Tred Hill were given by Mr. G. H. Barker (ornithology), who reported having seen twenty-two birds during the afternoon, and by Mr. L. Franzen (entomology), who reported the capture and showed specimens of the male and female of the very rare *Ioxidia crypsigramma*. Mr. J. E. Young showed a series of lantern slides and specimens of some of the more interesting animals and birds seen by him in Western and Northern Queensland whilst a member of the Wilkins Expedition. A lecturette, illustrated by specimens and lantern slides, on "Honeyeaters," was given by Mr. G. H. Barker.

BRISBANE BUTTERFLIES OF THE FAMILY PAPILIONIDAE.

(By R. Illidge.)

SERIES III.

Papilio demoleus sthenelus,* Macleay.

Though universally distributed over Australia, the butterfly known under this name is in many parts of extreme rarity, whereas in others it occurs in great numbers. About Brisbane it has been frequently seen even flying across the streets. At Bulimba Point, on the open flats, once cultivated, it was for a few years not by any means a rare insect, and one year four perfect specimens were taken at one stroke of the net. It is a butterfly with a great partiality for open sunny spaces, free of timber. Here it flits rapidly close to the ground as if in search of something, probably the low-growing plants on which its ova are to be deposited. It also frequents gardens where it has a liking for geraniums, zinnias, ver-

**Demoleus*, a Greek leader killed by Aeneas in the Trojan war. *Sthenelus* went to the Trojan war on the side of Greece, and was with those shut up in the wooden horse.

bona, and such like flowers, and it is amongst these it will settle for the purpose of sucking the nectar, and if the collector is smart a capture may be made with comparative ease. During my trip to West Australia, the only record of its occurrence was in October, 1913, at Cunderdin, in the sand plain country, where it, a single specimen, was flying swiftly over the splendid wild flowers which clothed these plains. On our Downs country, near Killarney, in 1901, they were in vast numbers on the tall-growing *Verbena bonariensis*, every head of which was crowned with these butterflies. But the greatest number I ever met with was on the edge of the Jimbour plain between Jandowae and Dalby. They were in flight on this occasion, and dashed along at great speed, rarely stopping for a moment. It is of little use looking for it in timbered country.

The caterpillars of this insect are green with yellowish and brown markings. The chrysalis is usually green with dark markings though much depends upon its location when pupation takes place. The perfect insect is dark brownish-black with sulphur yellow or bright ochreous markings; forewings with yellow indistinct strigae, hind wings with red tornal spots blue dusted above and eye-like spots below and near end of costa.

***Papilio anactus**, Macleay. The Small Orange Butterfly.**

This does not seem ever to be a very common insect, though numbers may be bred from the larvae or even the ova. The simplest way to do this if you have the orange or other citrus plants on which they live, is to take any convenient part of the tree and enclose it with fine mosquito net. In this they will thrive comparatively free from various other insects, birds, etc., which are inimical to their existence. About Brisbane the insect is quite sufficiently numerous for the entomologist who desires specimens for cabinet purposes. It is a rather neat if not specially bright species, and the writer who described it as smoky-brown must have seen very old and faded examples. It is black in general colour, with white markings, the white on the forewings being more or less dusted with grey; the incisions are white; a sub-marginal row, variable in number, of red spots, and above these some blue lanules, and it has a short tail-like process in male.

**Anactus*.—Uncertain, may be from *Anactes*, a name given to Castor and Pollux (the Twins) by the Athenians.

In its general habits it shows a preference for sunny glades, especially on hill-tops. In these situations it glides lazily along in a regular beat, and if disturbed merely retreats for a time, returning very soon. Even if violently frightened by a miss-shot of the net, it will eventually come back and settle in the same place. Like many other butterflies, lazy as it appears, you must not think you are going to have an easy capture, for its eyes are upon you, and when the sweep is made it has instantly dropped towards the ground, and sailed away in a very speedy manner.

The native food plants are the wild limes, *Atalantia glauca*, *Citrus australis* (wild orange), and *Citrus australasica* (finger lime). *Atalantia glauca* is common on the Darling Downs, hence the appearance of the *Anactus* butterfly there not uncommonly. At Kilrock, Jandowae, the larvae were seen in various stages. In the old coastal scrubs near Brisbane the wild orange abounded, and a few are still found a few miles below Bulimba. At Tambourine the finger lime has now probably been almost exterminated.

***Eurycus cressida cressida*,* Fabr.**

A common species in various localities round Brisbane, usually termed the "big greasy" by our boys and girls. The male and female are very different in appearance, though both have areas of the wings devoid of scales, and are hence largely transparent, especially in female. The male has the forewing hyaline with base, and a large ovoid spot in middle, and another smaller at end of cell deep black, the border suffused black. The hind wings are mostly black with a central band of white divided by veins into irregularly shaped spots; five subterminal spots dull reddish, usually much obscured by black scales, but occasionally deep red, as brilliant as on the under side; the apex of body ringed with red. The female is transparent with a small spot in end of cell of forewings and termen dusky with five whitish spots. The sexual characters are remarkable.

Though usually a poor, yellowish-brown insect when taken on the wing, the female upon emergence from the pupa is really very pretty and exhibits a bright yellow radiance such as is seen in some danaid butterflies of

*Cressida, daughter of Calchas, a Trojan priest who took part with the Greeks.

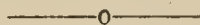
New Guinea and contiguous islands. This colouration unfortunately is fugitive.

The caterpillar and chrysalis are well known and easily collected on or about a small trailing *Aristolochia* found growing on Taylor's Range and other hills around Brisbane. Once when camped on Cootchie Muddlo, an island forming the northern boundary of Redland Bay, a large number of extra fine specimens were obtained from pupæ collected there. Recently Mr. Franzen found many on or about the food plant at Mt. Cootha, and to him I am indebted for the specimens figured.

It seems to be a great wanderer, and is often found in our garden at Bulimba. We do not disturb them, as they are quite harmless to the vegetation, except the wild *Aristolochia* not found hereabouts. It is often seen in the streets of the suburbs, and occasionally of the city.

The male butterfly exhales a very pleasant perfume.

Note.—There is another butterfly much smaller, which the children term the "little greasy." It however belongs to a different family of butterflies known as Nymphalidae, containing six sub-families, and is included in that known as *Acrainae* under *Acræa andromacha* of Fabricius, and is our only representative, though the *Acræinae* are numerous in species in Africa.



THE SUN AND PLANT DISTRIBUTION.

By D. A. HERBERT, M.Sc.

[Presidential Address delivered before the Annual Meeting of the Queensland Naturalists' Club, 19th February, 1928.]

In the interior of rain forests daylight fades long before the sun has set, owing to the interception of light by the canopy of leaves. The tree-tops may be receiving the last rays of the setting sun, but the plants below are in semi-darkness. Even at mid-day the shaft of sunlight filtering through the upper leaf-story fails to disperse the gloom entirely, and the plants of the forest floor are subjected to a shortened day and weakened light. They develop broader and thinner leaves than do plants out in the open, and are adapted to make more use of what light is at their disposal. Delicate ferns thrive in such moist, shady habitats, and many are totally unfitted for

life in open situations. They are late arrivals in the plant colonisation of a country, depending on the protection afforded by densely packed trees. The dominant trees of the rain forest, however, are not shade loving. From across a valley we look at the forest on the opposite side, and see the crowns of the trees fitted into each other, the leaves arranged in a leaf mosaic, so that a continuous canopy of green is presented to the full sunlight. So efficient are the crowns in intercepting the sun's rays that only stray beams stab the shade beneath. The trunks of the tallest trees, too, are bare of limbs, and this is largely a result of the tree's love of light. Where light is insufficient the branches gradually die and fall off, leaving a clean trunk. Out in the open, the branches would persist as in the familiar case of the hoop pine, which in the rain forest has a bare columnar trunk. In Malayan countries mangroves are cultivated for tanbark, and are planted close; self-pruning takes place, and the stripping of the bark is made easier.

Rain forest trees are not all sun-loving. The heights of the species composing a forest vary greatly, and many never reach the top story. The lower ones prefer shade. Young trees of the dominant species, however, have to be able to stand a considerable amount of shade, or they would never be able to reach the sunlight. It is no uncommon thing in the forest to find numerous small trees apparently at a standstill, their stems weak, and their leaves few. When an opening occurs, as when a cyclone tears a gash through the forest or a tree falls and makes a clearing, these small plants shoot up rapidly. They have the faculty of enduring a long suppression period in their youth, and so can spend a long time attaining their objective—a place in the sun. Brandis has shown that the sal (*Shorea robusta*) is very tolerant of shade when young, and Brown finds that another dipterocarp (*Parashorea malaanonan*) may in the forest be seventy years in attaining a diameter of two inches, though it grows rapidly to an enormous size afterwards. The gum trees are different. They are sun lovers, and when cultivated in countries where the amount of sunlight is limited they are weakly. They have no long suppression period, and in their young state very few of them can tolerate such shade as occurs in the rain forests. Their place is not in dense formations except in the case of a few rapidly-growing columnar-trunked species such as *Eucalyptus saligna*, *E. regnans*, and *E. gonicalyx*.

These are not shade lovers, but grow in rain forests with their tops out in full sunlight. They grow very rapidly and before they can be suppressed by lack of light have their tops sufficiently illuminated. Size with these gums is not an indication of age. Giants of the Australian forests are often not more than fifty years old, and such rapid growth is as useful as a long suppression period. Most Eucalypts, however, are not able to compete with rain-forest types. Even those which invade rain forests in Queensland, such as *E. saligna*, usually do so round the fringes or along rivers, where there is more light.

The fundamental difference between rain forest trees and the average Eucalypt has an important bearing on the distribution of forests in this State. Rain forest trees, being sun lovers which can withstand shade, are capable of growing in any place where they have the right temperature and soil conditions. Eucalypts can grow only where they have the right temperature, soil, and light conditions. Rain forest types may therefore invade the open forest and force back the gums, provided there is sufficient moisture, but the gums cannot force back the rain forest. Now and then we see a gum such as the Moreton Bay Ash surrounded by rain forest trees; in such cases it is the gum which has been surrounded, not the rain forest which has been invaded.

Blady grass in North Queensland covers great tracts of country. It consists of various species of grass several feet high, and after bush fires comes up thickly. In virgin bush untouched by fire it is not greatly in evidence, but burning off provides the sunny condition it needs. In the course of time other plants force their way up through it and gradually suppress it. It cannot tolerate shade, and ultimately, unless assisted by repeated fires is choked out by other sun-loving but taller growing plants. A small tree, *Macaranga tanarius*, is one of the commonest of these, and it in turn may be suppressed by rain forest types if there is sufficient moisture in the soil. In the Philippine Islands a passion vine, *Passiflora foetida*, which is common in North Queensland, is used for suppressing blady grass (locally known as cogon): it makes a tangled mass in the shade of which the grass does not thrive.

It is apparent that the light tolerance of plants, therefore, is an important factor in their distribution, and also in the re-vegetation or colonization of plantless areas. In horticulture, too, it is of considerable import-

ance. One of the facts known to every Brisbane gardener is that some plants will not flourish close to the south-side—the shady side—of the house, whereas on other sides they grow well. Some on the other hand grow best in the shade. Many ferns, Primulas and Begonias, show this preference, and there are numerous plants of intermediate taste. There are two important factors at work—the amount of heat and the amount of light. In Queensland we have practically the same duration of light on the tablelands as on the nearby lowlands, but the increased altitude results in a reduced temperature, and temperate plants, both weeds and cultivated species, which in Brisbane either fail or grow with difficulty, thrive on the Darling Downs. The important thing here is temperature. The thriving of some plants on the shady side of Brisbane houses is due to something more than temperature alone, though this is important. Many delicate species cannot survive exposure to full sunlight. Their leaves, thin and internally constituted so as to function efficiently in weak light, are scorched and bleached by exposure. Even amongst such sun-loving plants as roses there are varieties, such as Hadley, which take on an undesirable bluish tint in strong sunlight.

Full exposure to sunlight and heat is required by such plants as erotons and acalyphas, which make wonderful displays in North Queensland. Where these conditions obtain all the year round, zinnias, sunflowers, and other heat and light-loving annuals, may be grown all the year round. In Southern Australia they may be grown only in the summer. Many glasshouse plants, such as ferns, begonias, and aroids, flourish in hot surroundings, but avoid intense sunlight. Under glass tomatoes, grapes, bananas, and pineapples are grown in England. Darwin's highest praise of the Tahitian pineapples was to compare them favourably with those grown in England. Here is a case where heat is important, light being subsidiary only.

A few observations on cultivated plants in Brisbane show the effect of sunlight on the flowering of some common species. Candytuft with us is in full bloom in July. In an oval of plants edging a flower-bed in the middle of which grew tall plants, those on the north side received the morning and afternoon sun, those on the south being shaded most of the day. Those with the northern exposure had on an average forty-nine heads of flowers each, those on the south twenty-three, or less

than half the number produced by the plants in the sunny position. In the Brisbane Botanic Gardens it is the custom to grow sweet peas in pillars by planting a number of plants round a tall wire netting cylinder. When the pillars were at their best in the winter of last year they averaged about 39 flower stalks on the north side and three on the south. In the middle of July there were 200 stalks flowering on the nineteen pillars in one bed, and only two on the south side. Trees of *Bauhinia purpurea* in Woolloowin were in full bloom on the north and east sides at the end of June, had only a few isolated flowers on the south; in the middle of August the north side was still flowering, and the south had come into full bloom. This tree had retained its leaves, so that the south side was shaded; others without leaves, and where, therefore, the sunlight passed freely through their bare framework without much obstruction had a more even distribution of flowers on both sides through the season. Mangoes in Brisbane set earlier in the north and east sides of the tree.

In the Museum gardens is a plant of the common *Bougainvillea*, which commences flowering on the side facing the Valley before the other parts show any colour. This is rather remarkable, as a line may be drawn across the plant separating the flowering from the non-flowering portion. In the morning the reason is apparent. One half—the flowerig half—catches the morning sun. The rest receives its sunlight later in the day.

Such observations point to the fact that the north and east sides of many plants develop blossoms earlier or in greater profusion than the south and west sides, and that those with a southern and western exposure (as in the case of the sweet peas) are relatively unsuccessful. The south side is the shadiest side in Brisbane, so its behaviour is easily understood, but the west may receive as much sunlight as the east does. The difference between the effects of morning and afternoon sunlight is quite marked and at first sight this does not seem what should be expected if their amounts are about the same. It is difficult to measure the relative value of the light at different times of the day with respect to its photosynthetic value to the plant. Our methods of measuring light intensity with photometers using photographic paper do not provide a perfect means of registering the amount of radiation of importance to plants as they record mainly that of shorter wave lengths. They do indicate,

however, that the difference is not so great as to lead us to expect the difference in effect which is observed in plants.

The important difference is in the amount of heat received by the plant during the day. In the morning the eastern side receives the direct rays of the sun and the temperature rises. The western side remains cooler until the afternoon when its temperature is raised. The eastern half by this time shaded, does not cool down to the same temperature as that of the western side in the morning, so that taking the whole day into account the eastern side receives the greater degree of warmth. This hypothesis is supported by experimental evidence. In the case of *Carnegiea gigantea*, the Giant Cactus of Southern Arizona and Sonora, measurement has shown that on the eastern side the temperature is 2 deg.C. higher on the average than on the western. In this plant as it grows at Tucson, Johnson has observed that the flowers on the east side develop more rapidly and begin to open first. Those on the west side develop more slowly, and first begin to open many days after blooming has started on the east side. Every plant has an optimum temperature which is most favourable for its growth. A small difference, such as that between the eastern and western sides of a plant may bring the temperature sufficiently near the optimum to cause very marked acceleration in growth. Molisch's experiment shows that one part of a plant may be forced into action by heat while near-by parts remain dormant. He immersed twigs of dormant branches in warm water (30—35 deg. C. or more) for ten or twelve hours and found that they soon commenced to shoot, whereas in the adjacent untreated parts the buds were unchanged in appearance. A commercial application of growth acceleration by heat is the hot-house forcing of cultivated plants. The smudging of the mango, which is adopted in some oriental countries to ensure the setting of the fruit, may have the same effect. Smoky fires are built round the trees, and it is often considered that the raising of the temperature is the stimulus to increased fruit production. The late Professor C. F. Baker, however, considered that the killing of sucking insects at the critical period was more likely, while other observers consider that the action may be due to chemical stimulus from the smoke.

Mosses, algae, and lichens are usually found on the southern side of rough barked trees in Brisbane. (The

green coating looking like bright paint on the south side of fences, is *Protococcus*, an Alga.) The north side is usually bare or almost bare of these plants. The reason is apparent after a rainy night followed by a sunny day. The northern side of trees and fences is soon dry, but the southern side stays moist all the morning. In the case of smooth barked plants both sides dry rapidly, and epiphytic cryptogams have little chance to become established. It is a matter of moisture only, as on the northern side, where the contours of the trunk allow the bark to stay moist, mosses, algae, and lichens grow abundantly. The plants grow on the cooler side because that side is less liable to dessication and not because of temperature preference.

It has long been known that alterations in the length of day have a pronounced effect on plant life. The increasing of the period of exposure to light by artificial methods in some cases induces earlier fruiting, but in others retards or altogether suppresses it. Work on this subject by Garner and Allard in America has been carried out on a large scale, and the results are of exceptional interest. Many of their plants are not common in Queensland, but a few which are grown here may be mentioned. *Cosmos bipinnata*, in Washington, flowered at the height of 30 inches under normal day length. When the light period was continued until midnight by means of electric light the plants continued to grow until they attained the height of fifteen feet. Nearly a year later, when the return of winter shortened the days again and the electric light treatment was discontinued the plants flowered. Similar behaviour is not uncommon in Brisbane, where in the long summer days the *Cosmos* grows to a height of eight or ten feet, and finally flowers in the shorter autumn days. Plants whose growth takes place in the winter attain only about three feet. Shortening the long North American summer day in the case of *Sorghums* obtained from British India and from tropical Africa, resulted in a much earlier date of shedding of the first pollen (over four months earlier in some cases), increased stature, and in some cases increased stooling as compared with controls exposed to the ordinary length of day. Long exposure every day increased the height and seed production of buckwheat (*Fagopyrum vulgare*) over that of plants given short periods of illumination: this plant makes its best growth in high altitudes where the summer days are long.

The ordinary poinsettia, which is at its best with us in midwinter, depends for its flowering period not so much on the temperature at that period as on the length of the day. By shortening the day to ten hours, this plant may be made to flower at any time of the year. Potatoes illuminated till midnight grew to about six feet and produce few tubers. The plants, developing rapidly under these conditions, produce luxuriant foliage, but tubers, being resting organs, are not formed.

Garner and Allard formulate the principle of the action of the length of day in these words: "Sexual reproduction can be attained by the plant only when it is exposed to a specifically favourable length of day (the requirements in this particular varying widely with the species and the variety) and exposure to a length of day unfavourable to reproduction but favourable to growth tends to produce gigantism or indefinite continuation of vegetative development, while exposure to a length of day favourable alike to sexual reproduction and to vegetative development extends the period of sexual reproduction and tends to induce the "everbearing type of fruiting."

Wanser's work on wheat has an important bearing on the acclimatization of some varieties. In America winter wheat when planted in spring produces a well-developed rosette and flowering is delayed. This was formerly thought to be a matter of temperature, but Wanser has shown that a shortening of the day to correspond with the length of the winter day induces normal behaviour.

An important commercial application of the principle is made in the raising of a variety of tobacco known as Maryland Mammoth. In Southern Maryland this variety is valuable because of its luxuriant vegetative growth. It gives a high yield of leaf, but does not flower except in the greenhouse in winter. The days are short in winter, but the temperature outdoors is unfavourable. In the greenhouse, however, the greenhouse trouble is overcome. Seed is now obtained from plants raised in the open in winter in Southern Florida, where a suitable temperature is accompanied by a suitable length of day. The rapid development of flowers by lettuce and by cabbage in Brisbane in summer may be explained as a photoperiodic response, and experiments with these and other plants behaving in a similar way should be valuable from an economic point of view. By shortening

the day by covering the plants for a few hours each day it should be possible to produce good heads of cabbage and lettuce in summer in Brisbane without the risk of their shooting up into flower.

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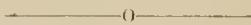
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NOTES ON EGG-LAYING OF THE LONG-NECKED TORTOISE (*Chelodina longicollis*).

By Mrs. S. CURTIS, Upper Albert River.

Some little time ago we heard the fowls making a fuss, so we went out to see what was worrying them. Their trouble was a long-necked tortoise who was making her way up the incline from the water hole in front of our home. Just to find out all we could about her we turned her onto her back. This proceeding did not please her, and she ejected a lot of water. When we had inspected her we turned her on to her feet again, and once more a lot of water flowed from her. For a little

time she just stayed in the same position we left her in, then quite suddenly she stretched her long neck as far as she could, and turning round quickly returned to the water hole. It was no wonder our fowls were disturbed, as the creature is anything but beautiful to look upon with her long neck that reminds one somewhat of a black snake. Also the awkward way she raises herself to crawl along is anything but graceful.

Just a fortnight after this the fowls once more told us something strange was about, so again we investigated, and this time found the tortoise busy digging a hole to lay her eggs in. (Such a muddy mess and still more mud being added as the tortoise dived her foot into the hole and fetched out more mud. The land round is very dry, but she carried water and used it to moisten the earth as she worked. We watched her for quite a long while and she worked away with one foot until she must have got tired, and then changed over to the other. It seemed to us she dug until it was impossible to reach further and then began her egg laying. This part of the business seemed to be got over very quickly, as the eggs came in quick succession, and as each fell into the hole she put her paw in and seemed to tumble the egg about in the mud a bit and then push it back. They seem to lay from 9 to 12 eggs, as we have dug up several nests, and these are the average contents. After she has finished laying she scratches all the mud back into the hole, and very often it is almost impossible to notice anything has disturbed the ground at all. We timed one to see the length of time it took, and it was three hours from start to finish. This speed was fairly good. I think, as the work was all done with the back feet, and she could see nothing.

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HONOUR FOR Mr. R. ILLIDGE.

At a meeting of the Entomological Society of Queensland, held at the Queensland University on the 20th October, Mr. R. Illidge was elected an Honorary Member. Some time ago the constitution of the Society was amended to allow for the election of a limited number of honorary members, and Mr. R. Illidge is the first to be elected, honorary membership being conferred on him in recognition of his outstanding services to entomological science in Queensland.

ANNUAL REPORT OF THE COUNCIL

Of the Queensland Naturalists' Club for year ended
31st December, 1927.

The Council has pleasure in submitting the 22nd Annual Report on the work of the Club.

MEETINGS.—Ten Council meetings, nine general monthly meetings, a Wild Flower Show (afternoon and evening), and nine field excursions were held during the year. Lectures illustrated by lantern slides were given by Dr. E. O. Marks, Mr. J. H. Simmonds, Mr. Inigo Jones, and Dr. F. W. Whitehouse. The excursions were to Russell Island (Easter), Enoggera (Labour Day), Mount Crosby (King's Birthday), Hopedale, Albert River (the home of Mrs. S. Curtis) (week-end), and Kalinga Park, Sunnybank, Sandgate, Chermiside, and Kuraby, all on Saturday afternoons. The Annual Wild Flower Show was held on September 5th in the Albert Hall. The railway strike interfered to some extent both as regards the exhibits and attendance, but in spite of this the show was a great success, due to willing helpers, both in the country and the city.

MEMBERSHIP.—Twenty-six new members were enrolled, seven resignations were received, and the names of four unfinancial members removed from the list. The club membership now stands at 134; of these 103 are ordinary members, 23 country members, 6 honorary members, and 2 life members.

KOALA OR NATIVE BEAR.—A protest against the opening of the season for native bears was carried unanimously at the July meeting. This was followed by a combined deputation of representatives of scientific bodies in Queensland, but unfortunately the efforts were unsuccessful.

LIBRARY.—The Honorary Librarian (Mrs. Phoebe Kirwan) reported the receipt of 197 exchanges of books, magazines, and reprints. Approximately 100 books, etc., were borrowed by members during the year.

"QUEENSLAND NATURALIST."—The Honorary Editor (Mr. C. T. White) reported that owing to the lack of material it was unfortunately only possible to issue two numbers of the Club's journal during the year.

D. A. HERBERT,

President.

(Miss) E. N. BAIRD,

Honorary Secretary.

The Queensland Naturalist.

JOURNAL OF THE QUEENSLAND NATURALISTS' CLUB
AND NATURE-LOVERS' LEAGUE.

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No. 5.

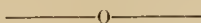
PROCEEDINGS.

EVENING MEETING, 16th APRIL, 1928.—The president (Mr. J. E. Young) occupied the chair. Reports on the recent excursion to Canungra were given by Dr. E. O. Marks (geology), Mr. L. Franzen (entomology), Mr. G. H. Barker (ornithology), and D. A. Herbert, M.Sc. (botany). Mr. J. C. Smith exhibited a particularly large phasma and a couple of very fine specimens of the butterfly *Hypolymnas belina*, captured by Mr. D. Curtis, of the Upper Albert River. Mr. Nebe exhibited a number of dried specimens of plants from the Bunker and Capricornian Islands. These were commented on by Mr. C. T. White (Government Botanist).

EVENING MEETING, 21st MAY, 1928.—The vice-president (Mr. D. A. Herbert) occupied the chair. Reports on the excursion to Hercules Bank were given by Mr. J. O'Neil Brenan (birds) and Mr. D. A. Herbert (plants). The reports were commented on by Mr. G. H. Barker and Mrs. W. M. Mayo. Mr. D. A. Herbert showed specimens of (a) the fruit of *Barringtonia speciosa*, a tropical tree, the fruits of which are sometimes found on the ocean beaches of south-eastern Queensland; (b) a specimen of prickly pear (*Opuntia*) that had been lying in a drawer for five years and had sprouted; and (c) specimen of maize with cob on the male panicle or "tassel."

EVENING MEETING, 18th JUNE, 1928.—The president (Mr. J. E. Young) occupied the chair, and there was a good attendance of members and visitors. Miss Nobbs, Miss Twine, Mr. Tommerup, and Mr. Nicholls were nominated for membership. A welcome was extended to Mr. and Mrs. Butler and Miss Gilbert from Tasmania and members of the Field Naturalists' Club of that State. A report on the birds observed at the excursion to Upper Brookfield by Mr. G. H. Barker and himself was given by Mr. J. O'Neil Brenan. Mr. L. Franzen exhibited an

interesting collection of neuropterous insects from Northern Queensland, some of which probably represented undescribed species. Mrs. J. Smith exhibited specimens of early Roman pottery (probably about 50 B.C.), from excavations being carried out at Carleon, near Cardiff in Wales, the work being financed by the London "Daily Mail." Mr. D. A. Herbert gave an account of his recent visit to Tasmania, where he attended the nineteenth meeting of the Australasian Association for the Advancement of Science as delegate of the Club. After the conference some of the members and delegates spent a week on Mount Field, where many interesting trees and plants are to be found. The vegetation ranges from rain-forest at the base to stone fields on top, the only vegetation found here being the peculiar cushion plants developed in mountain regions in many parts of the world. As the top of the range was approached, the trees became smaller and mountain gums at the base of the mountain with long columnar trunks of perhaps a hundred feet, towards the top became dwarfed to mere bushes a few feet high.



ANNUAL REPORT OF THE NATURE LOVERS' LEAGUE SUB-COMMITTEE

For year ending 31st December, 1927.

The sub-committee appointed by the Council in March, 1927, to further the work of the Nature Lovers' League (consisting of Messrs. D. A. Herbert (chairman), C. T. White, G. H. Barker, Dr. F. W. Whitehouse, and Mrs. W. M. Mayo, together with the Honorary Secretary) have pleasure in submitting the report of their year's work to you.

Four meetings of the sub-committee were held during the the year, at which all members were present. Following on the work undertaken last year amongst the trainees at the Teachers' Training College (a work commended by the Principal of the College and the Department of Education) it was proposed to carry on by giving a course of weekly lectures to the student teachers on subjects calculated to arouse their interest in the different branches of Nature Study before they were drafted out into the country schools. With the approval of the authorities concerned, lectures were given each Friday afternoon during the term to (approximately) eighty teachers. Four lectures each, making a total of

sixteen, were delivered as follows:—Mr. D. A. Herbert, M.Sc., "Plant Life"; Mr. C. T. White, Government Botanist, "Queensland Trees"; Dr. F. W. Whitehouse, "The Origin of Scenery"; Mr. G. H. Barker, "Some Phases of Bird Life."

Two afternoons were set aside for study in the field, but had to be abandoned owing to the rain.

During the month of July, on the Government proclaiming an open season for Koalas (native bears) in August, your sub-committee took part with many other societies in trying to have that proclamation annulled. The effort to save the bears at that time was of no avail. Public opinion, however, was aroused to so great an extent that there is every probability of the bears being totally protected in the future.

Your sub-committee approached the Under-Secretary for Education on the advisability of including more lessons on the Natural History of Queensland in the State School curriculum. The suggestion was made that a book suitable to the fifth standard (and in a popular form) be compiled on Natural History subjects by members of the Nature Lovers' League, if the Department of Education would undertake cost of printing and publishing. Owing to financial stringency that proposition could not be entertained by the Department, though the Under Secretary quite recognised the need, but a further suggestion that a lesson dealing with Queensland Natural History, including plants, insects, birds, geology, be furnished to the Education Department by the Nature Lovers' League each month was approved, the Department to be responsible for printing same on leaflets and attaching to the "Education Office Gazette" for the use of teachers. The present year should see this work begun.

At intervals during the year complaints have been received of the shooting amongst the different island sanctuaries of Moreton Bay. Your sub-committee distributed printed sanctuary notices (received from the Department of Agriculture) to be affixed to trees on the islands, and also wrote to the Southport Chamber of Commerce and Town Council, drawing attention to the wanton destruction. Sympathetic replies were received from those bodies, and a number of gentlemen were recommended by them to the Department of Agriculture and Stock, and are receiving appointment as honorary

rangers. A letter was also sent to the Royal Queensland Yacht Club, asking them to use their influence to have the shooting evil abated in Moreton Bay.

The cause of the Emus was not overlooked during the year, and in one or two interviews with a very courteous Government official, your sub-committee was assured that the payment for scalps would not be continued after 31st December, 1927. Up to that date about 50,000 Emus and a like number of eggs had been destroyed—enough to thin the birds out considerably in pear country.

The thanks of your sub-committee are due to the Director of the Museum for bird specimens loaned at lectures.

D. A. HERBERT,
Chairman.

(Mrs.) W. M. MAYO,
Honorary Secretary.

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REPORTS ON THE EASTER EXCURSION TO CANUNGRA, April 6—10, 1928.

(a) General.

By J. E. YOUNG, President.

The holding of a camp out at Easter having become a general custom, it was decided to hold one as usual this year, the only variation being that whereas for the last few years various places in Moreton Bay have been visited, it was arranged to go inland on this occasion.

The site selected was on the upper waters of the Coomera River, about two miles from Canungra, on a considerable lagoon, backed by magnificent native trees, about a mile above the site of the projected dam, for impounding a water supply for Brisbane, and on the property of Mr. W. G. Franklin. The party numbered thirty-two.

No extensive trips were undertaken on the first day, but a few of the party in the afternoon walked over the ridge to Back Creek, at the foot of Beechmont North, and found much of interest, though a much longer time might well have been spent in this direction.

On the two following days the party was split up, some each day visiting Tambourine Mountain, on the one

hand, and Beechmout on the other, both places being reached by winding roads and fairly steep grades, and in the latter case through much still-standing vine-scrub, the views from either point towards the sea, and the Macpherson Range being exceptionally fine.

On the Monday, by courtesy of Messrs. Laheys Ltd., a trip into the ranges on their timber train was arranged and proved a very fine outing. The route lay over forest ridges, clearings, and creeks, until the virgin vine scrub was reached. From this point the line ran through a tunnel in the thick vegetation, alongside being seen lordly pines (*Araucaria Cunninghamii*) and figs, some of which were laden with ferns, orchids, and other epiphytes, besides numerous other kinds of trees and shrubs. At the 11-mile mark, the line ended in a small clearing beside a running creek in the vine-scrub.

Rambles about the locality were indulged in, some penetrating into the National Park, the boundary of which was close by. Messrs. Laheys Ltd. are to be congratulated for not allowing the removal of ferns and orchids from their properties here. It may be mentioned that Queensland people have largely to thank Mr. Romeo Lahey in securing the National Park—a 47,000 acre sanctuary for Queensland wild life.

Bathing in the lagoon was frequently indulged in, and the camp generally voted it a beautiful situation, and was much enjoyed by all. Should the projected dam be erected, the camp site and for a considerable distance up the valley will be submerged to a depth of up to 140ft., and it will be a matter of great regret to the Club that such a fine area should disappear, and as the locality was much too large to be thoroughly worked in the time at our disposal, it is to be hoped that various members will be able to make further visits to the district and properly record its natural history resources, ere this happens.

(b) Geological Notes.

By E. O. MARKS, M.D., B.A., B.E.

For a geologist Canungra is a very interesting centre, but an Easter excursion does not give time to more than "scratch the surface" of the local geology and develop a desire for further deeper investigation.

The oldest formation in the district is the Brisbane Schist, the boundary of this being about three miles to the east of our camp on the Coomera.

The next formation in order of age is the extensive Bundamba Sandstone. This is the rock constituting the country (excepting of course alluvial flats), which we travelled over from Logan Village to Canungra, and which forms the ridge between that township and the Coomera. It was also noted for some miles up the Coomera Valley on our way to the National Park. The Bundamba Sandstone is the middle of the three stages into which the formerly named "Trias-Jura" is divided. The uppermost of the three stages, the Walloon coal measures, occurs in the neighbourhood of Beaudesert and is now regarded as of Jurassic age, while the lowermost or Ipswich coal measures (regarded as Triassic) occur near Logan Village, and outcrop in a narrowing strip running southward along the schist boundary until that boundary is covered by the basalt, of the north end of Tambourine Mountain.

One object to be investigated at Canungra was whether the Ipswich measures come to light again to the South of Tambourine, or whether the Bundamba there rest directly on the schist. It was found that this relationship is obscured by volcanic rocks, at least on the route which we took. Of these there are two main types, the light-coloured rhyolitic or "acid" lavas (here the older of the two types) and the basaltic lavas which are dark in colour, chemically "basic" and decompose into the rich soils popularly known as "volcanic."

These basalts and allied rocks form a capping to all the higher mountains in the vicinity—Tambourine, Beechmont, Canungra, and so on to the Roberts Plateau.

The rocky bar across the Coomera at the camp, and the rough, rocky gorge for at least a mile down stream therefrom are formed of or in the rhyolite, which extends also to the eastwards as far as the boundary of the schist. It was also noticed for a considerable way up the Beechmont road to the east of the Coomera crossing.

The occurrence of the rhyolite in the bed of the Coomera, at a much lower elevation than the sandstone of the ridge between the Coomera and the Canungra, and which is directly overlain by the basalt of Tambourine, suggests a different relationship and requires further investigation. Its occurrence on the boundary of schist and mesozoic sediments, is somewhat like that of the Brisbane Tuff, which lies at the base of the Ipswich. It is however usually regarded, like the basalt, as being of Ter-

tiary age, but this, though probably correct, also calls for further field work. The rhyolite shows in a very perfect degree the banding and spherulitic structures characteristic of this type of rock.

As already mentioned, the basalts cap all the higher hills, and a view of them from any of the summits can leave no doubt that they once have all been part of the one great lava field, and are now only separated by the valleys cut in it by the streams. On a former occasion I suggested that these remarkable parallel streams, separated by high basalt-capped divides, owed their parallelism to an origin on the evenly sloping surface of the lava flow. It was interesting to observe Back Creek running this parallel course, with the Nerang on one side and the Coomera on the other, but still largely on top of the basalt of Beechmont, and more than 1000 feet above its neighbours on either hand.

(c) Botanical Notes.

By D. A. HERBERT, M.Sc.

The camp was pitched in a patch of open forest by the creek on a moist flat where the eucalypts and box trees were of relatively large size. Near at hand was a small patch of rain forest, but as usual the species in each formation did little trespassing on each other's territory. Several orchids, *Cymbidium suave*, *Dendrobium aemulum*, *D. teretifolium* (the pencil orchid) and *D. linguiforme* (the tongue orchid), were found growing as epiphytes in the open forest. The life of an epiphyte in this formation is rather precarious, and the great majority of rain forest types do not grow on open forest trees. It seems more than likely that the species mentioned represent a relatively unsuccessful attempt at colonization from the rain forest. *Cymbidium*, the most successful, occurring as it does in quite dry open forests, has succeeded largely as the result of rooting in hollow branches and trunks; in effect it has therefore become almost terrestrial. A ground orchid found in bloom was *Dipodium punctatum*, growing in the open forest. It is of interest in being almost leafless and obtaining its organic food material from the soil through the agency of a fungal partner.

Morchella deliciosa, an edible fungus, was collected, but was not common, only two specimens being found. The Jew's ear (*Hirneola auricula-judae*), used by the

Chinese for soups, was very plentiful on dead and dying branches. The horsehair fungus (*Marasmius equicrinus*), though not fruiting, was noticeable because of its peculiar black hair-like strands of mycelium stretching about from plant to plant. Dead and partially burnt wattles round the camp commonly had a population of a bleached white fungus, *Schizophyllum commune*, a weak parasite of cosmopolitan distribution. *Stemonitis fusca*, a myxomycete, was found fruiting in profusion on a rotting log in the rain forest; its fructifications look like microscopic hoop pines.

A few hours were spent at the end of Lahey's tramway, at the border of National Park. The Laheys have left the natural vegetation along the tram line, and some magnificent rain forest is to be seen. Most noticeable amongst the trees were the enormous hoop pines, their branches hung with the beard lichen, *Usnea*, and the trunks often bearing staghorn and elkhorn ferns and pencil orchids. The walking stick palm (*Bacularia monostachya*), just past fruiting at this point, was common, and had not been seen in the rain forests round Canungra, though at one time no doubt present there.

(d) Birds at Canungra.

By G. H. BARKER.

The most outstanding features of bird life at the camp and round it was that though there was always something to look at, never at any time were even small flocks seen on the way to Canungra from Brisbane by car. It was pleasing to see the magpies scattered along the route, noisy miners being the only other birds more in evidence; magpie larks, black-throated butcher birds, and pale-headed rosellas and kookaburras being also in evidence. Round the camp Pennant's parrakeet (or lowry), golden whistlers, and one of the eukoos could be heard most. Right alongside one of the tents a pair of red-browed finches were nest-building. In the scrub just behind the tents an unfamiliar owl, yellow robins, scrub tits, and other shy birds could always be seen. During our log train trip to Upper Coomera on Monday we saw the yellow-tailed black cockatoo, cat bird, rifle bird, and other rare species, which provided a fitting end to an ideal ornithologist's holiday.

List of birds seen or heard by members:—Little brown quail, peaceful dove, bar-shouldered dove, scrub

pigeon, wonga pigeon, coot, bald coot, spur-winged plover, scrub curlew, white-faced heron, white-necked heron, bittern, black duck, cormorant, wedge-tailed eagle, Nankeen kestrel, boobook owl, yellow-tailed black cockatoo, scaly breasted lorikeet, pale-headed rosella, Pennant's parrakeet, azure kingfisher, kookaburra, bronze cuckoo, Macleay's kingfisher, pheasant coucal, lyre-bird (Alberts), welcome swallow, brown flycatcher (Jacky Winter), white-throated warbler, white-shafted fantail, rufous fantail, willie wagtail, black-faced cuckoo shrike, Jardine caterpillar-eater, cochwrip bird, white-browed babbler, little thornbills (tit), yellow-tailed thornbills (tit), white-browed scrub wren, variegated (Lambert's) wren, orange-backed wren, magpie lark, grey-shrike thrush, black-backed magpie, black-throated butcher bird, grey butcher bird, golden whistler, rufous whistler, yellow-breasted robin, northern yellow robin, white-headed titella, white-browed tree creeper, mistletoe swallow, pardalote (?), silver eye (*Zosterops*), white-naped honeyeater, little brown honeyeater, lewin honeyeater, yellow-faced honeyeater, noisy miner, brush wattle bird, blue-faced honeyeater, leatherhead, little leatherhead, Australian pipit, red-billed finch, crow, currawong, green catbird, rifle bird, double-bar finch, bee-eater.

(e) List of Butterflies Captured or Observed.

By L. FRANZEN.

Family Nymphalidae.—*Danaida archippus* Fab., *D. hamata* McL., *Euploea corinna* McL., *Acraea andromacha* Fab., *Pyrameis itea* Fab., *Precis villida* Fab., *Hypolimnัส nerina* Fab., *Phaedyma shepherdii* Moore, *Melanitis bankia* Fab., *Hypocysta adiante* Hub., *H. meterius* Butl., *Heteronympha merope* Fab., *H. merifica* Butl.

Family Lycaenidae.—*Xenica acantha* Don., *Thysonitis taygetus* Feld., *Philiris innotatus* Misk., *Paralucia pyrodiscus* Ros., *Nacaduba felderi* Mur., *Zizina labradus* Godart, *Ialmenus evagoras* Don.

Family Pieridae.—*Delias nigrina* Fab., *D. argenthona* Fab., *Elodina angulipennin* Lucas., *Anaphaeis tutonia* Fab., *Huphina scyllara* McL., *Appias ega* Bois., *Catopsilia pyranthe* L., *C. pomona* Fab., *Terias zoraide* Feld., *T. sulphurata* Butl., *T. smilax* Don.

Family Papilionidae.—*Papilio sthenalus* McL., *P. aegeus* Don., *P. choredon* Feld., *Eurycus cressida* Fab.

Family Hesperidae.—*Trapezitis symmumus* Hub., *T. iacelms* Fab., *Toxidia peroni* Lat., *T. doubledai* Feld., *T. parvula*, Ploetz, *Padraona flavavittata* Lat., *P. lascivia* Ros., *Telicota krefftii* McL.

The following rare insects, of particular interest to the collector, were also found at Camungra:—Order, Neuroptera; Fam., Osmylidae; *Porismus strigatus*, Burm., *Oedosmylus pallidus*, McL. Order, Mecoptera; Fam., Choris-tidae; *Taeniochorista pallida*, Esb-Pet.

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THE EUCALYPTS OR GUM TREES OF THE BRISBANE DISTRICT.

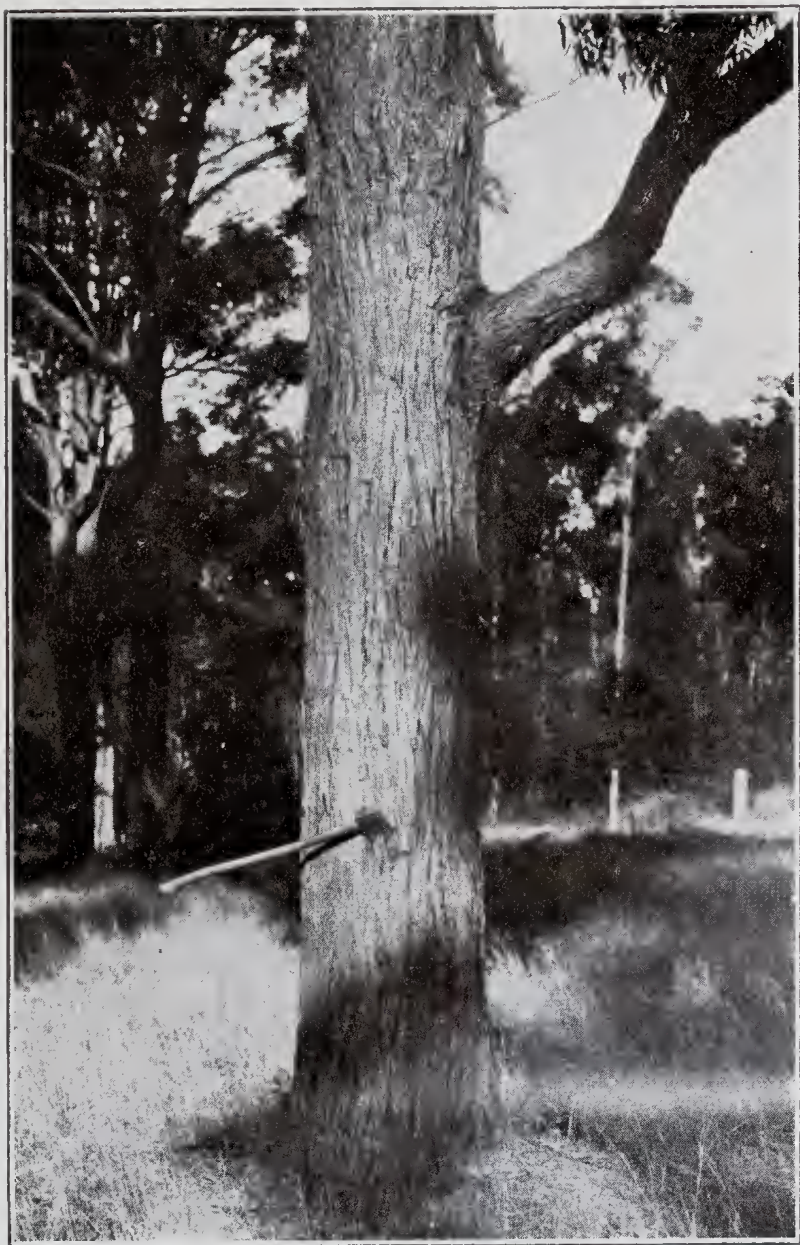
(By C. T. WHITE, Government Botanist.)

VII.

(Continued from the "Queensland Naturalist,"
Vol. 5, p. 96.)

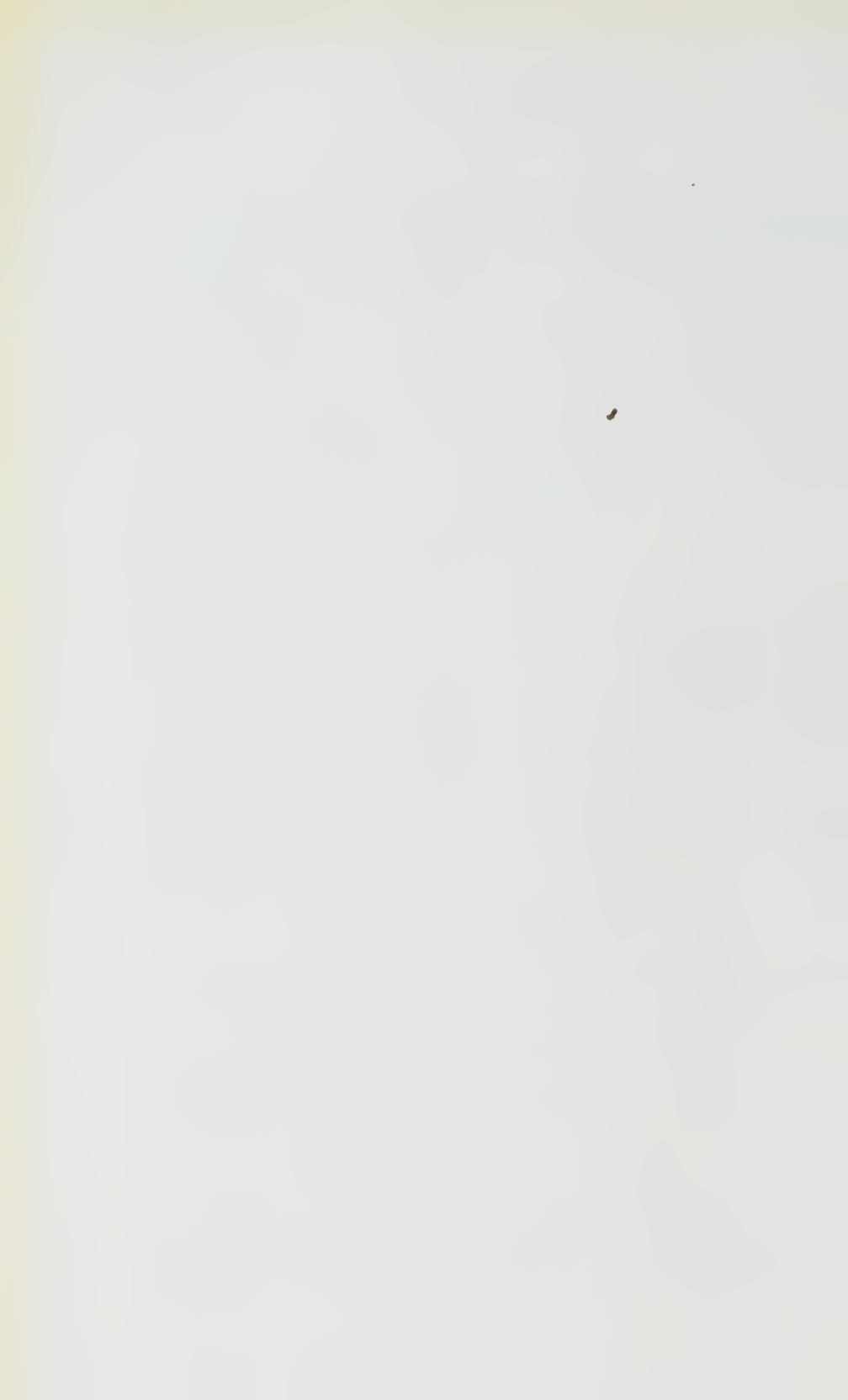
11. *Eucalyptus resinifera* (Red Stringybark).

Description:—A large tree (or in poor sandy soils sometimes reduced to a shrub), with a rough fibrous bark, the outermost dead bark bleached a dark grey and usually more or less blackened by fire; inner bark dark reddish-brown. Young branchlets angular but soon becoming rounded. Coppice leaves or leaves on young trees not markedly different from those of the adult, but not so falcate; lanceolate in shape; dark green above, much paler beneath; attaining up to 7 inches in length and 2 inches in breadth, but usually much smaller; apex acute, tapering to a fine point; base cuneate; petiole variable; in the smaller leaves $\frac{1}{4}$ in., in the larger ones up to $\frac{3}{4}$ in. in length; veins and veinlets numerous, readily visible, intramarginal vein very close to the edge, in the larger leaves about 1 line from the edge, but in the smaller ones much closer. Ordinary (secondary or adult leaves) coriaceous, lanceolate, usually more or less falcate; somewhat paler on the under than on the upper surface, though this not always discernible in dried specimens; base cuneate, upper part tapering gradually to a long acuminate apex; petiole $\frac{3}{4}$ —1 in. long, blade up to 7 in. long and $1\frac{1}{2}$ in. broad, but usually somewhat smaller, averaging 5—6 in. long and about 1 inch broad; midrib distinct,



RED STRINGYBARK (*Eucalyptus resinifera*), Mount Gravatt,
near Brisbane

[Photo by C. T. WHITE.]



lateral nerves arising from the midrib at an angle of about 45 deg., fine and numerous, visible but not very distinct, $1\frac{1}{2}$ —2 lines apart; intramarginal vein very close to the edge, usually almost touching, but here and there about $1/25$ in. from the margin. Flowers in simple umbels in the upper leaf axils of the branchlets; umbels 5—9 flowered; peduncle $\frac{1}{2}$ — $\frac{3}{4}$ inch long, flattened and often more or less twisted; calyx tube turbinate (narrowly so in the bud), about $\frac{1}{4}$ inch long, tapering at the base into a distinct pedicel of about the same length; operculum narrow-conical, about $\frac{1}{2}$ inch long; stamens all fertile; seed capsule on stalk of about $\frac{1}{2}$ inch, 3-4 celled, broadly turbinate; about 4 lines diameter across the top, usually with a rather broad rim up to $\frac{1}{4}$ inch deep; valves protruding 1-2 lines high.

Distribution.—Eastern Australia from the Picton district, south of Sydney in New South Wales (Maiden) to the Atherton Tableland in North Queensland. About Brisbane it occurs mostly on the sandstones and on the shales. About Brisbane the trees are often handsome, but the boles gnarled and blackened by fire. On Stradbroke Island, Moreton Bay, it occurs as large trees, or upon poor sandy hills as a shrub of smaller growth, associated with *Eucalyptus Planchoniana* and *E. corymbosa*.

Common Name.—In Queensland it is universally known as "Red Stringybark"; in New South Wales Maiden gives the names "Mahogany," "Red Mahogany," and "Forest Mahogany" as in general use.

Botanical Name.—*Eucalyptus* (see under No. 1) *resinifera*, from the Latin **resina**, resin, and **fero**, I bear. The specific name was rather poorly chosen, as the species yields comparatively small quantities of resin. Maiden ("Forest Flora of New South Wales," 1. 64-71) states that in the original description in 1790 two trees were confused, the bark and wood of one being described, and the flower buds of another. The flower buds apparently belong to our "Red Stringybark," but the bark and wood described were probably those of *Angophora lanceolata*, hence the specific name.

Timber.—The straight-grained red wood is one of the most popular hardwoods for house building, particularly for weatherboards; used also for waggon sheeting. Rather subject to pin-hole borers. (Forest Bulletin 2, Queensland Forest Service).

Botanical Reference.—*Eucalyptus resinifera*. J. E. Smith in Surgeon John White's Journal, Voyage to New South Wales, 231 (1790).

12. *Eucalyptus engenioides* (White Stringybark).

Description.—A very large tree, the outer bark usually bleached a dark grey, but more or less blackened by fire; the bark usually more or less furrowed, thick, fibrous but inclined to be spongy, reddish-brown, innermost (living) bark bright deep yellow. Coppice (sucker) leaves and branchlets, or leaves and branchlets on young trees, clothed with stellate hairs, very dense on the branchlets and petioles, more scattered on the leaf-blades. Coppice (sucker) leaves or leaves on young trees at first varying from oblong to ovate-oblong, ovate or even lanceolate; up to 3 inches long, nearly as broad as long, or $1\frac{1}{2}$ times as long as broad; at other times in the more lanceolate leaves 3— $3\frac{1}{2}$ times longer than broad; all forms gradually tapering into the glabrous secondary or adult leaves, though the juvenile type may be found on trees up to 20 feet high; petiole mostly about 2 lines long; blade paler on the under than on the upper surface; base rounded or more or less euneate, oblique or less frequently equal; apex acuminate or gradually tapering to an acute apex. Secondary or adult leaves glabrous, at first often very broadly lanceolate, straight or more or less falcate, the broader leaves usually very oblique at the base, on the flowering twigs much narrower and usually very falcate; up to 6 inches long and $1\frac{1}{2}$ inches broad; mostly about five times longer than broad, gradually tapering to a long-pointed (acute) apex, base oblique and tapering to a slender twisted petiole of $\frac{1}{2}$ – $\frac{3}{4}$ inch; lateral nerves and intramarginal vein rather prominent in the dried leaf, particularly on the under surface; lateral nerves oblique; intramarginal vein $\frac{1}{2}$ – $1\frac{1}{2}$ lines distance from the edge of the leaf. Flowers in pedunculate heads or umbels in the axils of the leaves, often on the secondary wood from which the leaves have fallen; peduncles $\frac{1}{4}$ – $\frac{1}{2}$ inch long, bearing a head or umbel of 5–15 flowers. Calyx-tube obconical or more or less turbinate and contracted at the base into a stout pedicel; a quarter to one-third of an inch long (including the pedicel when present); operculum short, conical, rather blunt or more or less pointed, about 2 lines high. Stamens numerous, all fertile; longest filaments $2\frac{1}{2}$ lines long; anthers minute, cordate or more or less reniform, cells opening by longitudinal slits. Seed



WHITE STRINGYBARK (*Eucalyptus eugenioides*), Mount Gravatt,
near Brisbane.

[Photo by C. T. WHITE.]

capsule depressed globose or hemispherical, truncate at the top; $\frac{1}{2}$ inch or nearly so in diameter, 3-4 celled; rim broad in the fresh fruit, chestnut or reddish-brown, and somewhat nitid; valves included or very slightly protruding.

Distribution.—Victoria, New South Wales, and Queensland; in the last State extending as far north as Herberton and the Atherton Tableland. It does not usually occur more than 100 miles inland.

Common Name.—“White Stringybark” is the name most commonly given to it in Queensland. “Grey Stringybark” and “Brown Stringybark” are also names occasionally applied.

Botanical Name.—*Eucalyptus* (see under No. 1) *eugenioides*, from *Eugenia*, an allied genus, and Greek *eidos*, like.

Timber.—Wood cut as a hardwood for general building purposes, but not specified for any special purposes.

Botanical Reference.—*Eucalyptus eugenioides*—Sieber in Sprengel's *Curae Posteriores*, IV., 195, 1827.

13. *Eucalyptus microcorys* (Tallow Wood).

Description.—A very large tree with a reddish brown fibrous bark, in more open forests and on poorer soils still a large tree, but the trunk usually very gnarled and branching from near the base; in denser forests and on better soils forming a straighter, longer bole; outermost bark shed in very small flakes or patches, inner bark fibrous, light brown. Coppice shoots often vinous or with a purplish tinge; coppice leaves and leaves on young trees comparatively thin in texture, ovate to ovate-lanceolate, under surface of the leaf markedly paler than the upper; up to 4 inches long and 2 inches broad, tapering to a long acuminate apex; base rounded or cuneate, usually but not always oblique, tapering to a petiole (leaf-stalk) of one-third to half-an-inch; veins and veinlets fine, visible in the green leaf but more prominent in the dried; intramarginal vein not very distinct but clearly visible under a lens; about one-twentieth of an inch from the edge; the leaf margin itself usually thickened, the thickening clearly visible under a lens. Ordinary (secondary or adult) leaves comparatively thin in texture for the genus; paler on the under than on the upper surface; lanceolate or ovate-lanceolate, commonly more or less fal-

cate, the upper part tapering to a long acute apex; base equal or oblique, tapering to a twisted petiole of one-third to half an inch; blade variable in length and breadth, up to $5\frac{1}{2}$ inches long and $1\frac{1}{2}$ inches broad, but the longer leaves not always the widest, sometimes the blade being 5 times longer than broad, at others only $2\frac{1}{2}$ times longer; midrib prominent, main lateral nerves ascending from the midrib at an angle of about 45° , fine but easily discernible, particularly on the upper surface, 2-3 lines apart, intramarginal vein $\frac{1}{2}$ to 1 line from the edge of the leaf, the margin itself slightly thickened, but the thickening often only discernible from the under surface. Flowers in lateral or axillary umbels; umbels mostly 7-9 flowered; peduncles $\frac{1}{2}$ - $\frac{3}{4}$ inch long; flower buds narrowly clavate (club-shaped); calyx-tube tapering into a slender pedicel, tube and pedicel together 4-5 lines long; the operculum very short, hemispherical, apex slightly umbonate, low (only about one-sixteenth of an inch high). Stamens numerous, in several series, the outer ones the longer and sterile, without anthers or with abortive ones only; inner stamens shorter, anthers minute, each cell opening wide by a longitudinal slit. Seed capsule obovoid-oblong, tapering at the base into a distinct pedicel, mostly about $\frac{1}{2}$ inch long (including the pedicel), about $\frac{1}{4}$ inch diameter at the top; 3-4 celled, valves flush with the top, or sometimes very slightly exserted.

Distribution.—Eastern Queensland and Northern New South Wales. In Queensland it does not seem to extend further north than Fraser Island (Wide Bay). In New South Wales, Maiden (Forest Flora of N.S.W., IV., 124) gives Cooranbong, 26 miles south of Newcastle, as the southernmost locality.

Botanical Name.—*Eucalyptus* (see under No. 1) *microcorys*, from the Greek *mikros*, small, and *korys*, a helmet, in allusion to the shape of the operculum.

Common Name.—“Tallow-wood” seems the name in universal use both in Queensland and New South Wales.

Timber.—The yellowish, somewhat greasy timber is of excellent quality, particularly for all purposes exposed to weather, and is specially in request for sleepers, veranda posts and flooring. Very durable (Bulletin No. 2, Queensland Forest Service).

Botanical Reference.—*Eucalyptus microcorys*. Ferd. von Mueller in *Fragmenta Phytographiae Australiae*, II., 50, 1860.



TALLOW WOOD (*Eucalyptus microcorys*), Tambourine Mountain).

[Photo by C. T. WHITE.]

NOTES ON THE GROWTH OF THE GREY MANGROVE (*Avicennia*) IN THE UPPER BRISBANE RIVER.

By C. J. J. WATSON.

The following regarding the growth of the Grey Mangrove (*Avicennia officinalis*) along the river at Chelmer may be of interest.

Since about April this year I have noticed that about fifty per cent. of the above mangroves in certain parts have been slowly dying and are now quite dead. I was at a loss to understand this at first, especially as dead trees were in many cases standing alongside trees in robust growth. On closer investigation I discovered that the small flood in January this year had deposited a considerable quantity of silt on the roots of the dead trees. This, being kept continually wet by the tides, seems to have had the effect of completely excluding the air from the buried pneumatophores or breathing roots, and completely smothering the trees. Trees which had all or portion of their roots exposed to the air were quite unaffected.

The submersion of the trees for over a week in dirty fresh water does not seem to have had an ill effect, and the silt did not seem to have any noticeable effect until a month or more had passed after the flood.

Since I came to live at Chelmer I have been puzzled to know why only comparatively small *Avicennias* are to be found in the river reaches here. The trees seem to thrive on the banks and grow very rapidly, some having grown over ten feet in height in the past two years. In spite of this, trees are seldom met with over six inches in diameter, while on the sea shore I have seen old hollow trees up to two feet in diameter, possibly a hundred years old. I should say that twenty years would produce 9 to 12 inches diameter at the rate of growth here.

The explanation seems to be in the recurring floods. Large floods carrying and depositing very large quantities of silt on backwater corners such as this, would probably completely exterminate these trees for the time being, until the tides again left the fruits on the mud banks. I believe that the largest of these trees now growing probably started life after the 1893 flood, possibly after the 1898.

These floods reached the following levels at this point on the river.

1893	..	About 38 feet above low water.			
1898	..	" 28	"	"	"
1908	..	" 20	"	"	"
1927	..	" 16	"	"	"

If the last small flood has caused such a high mortality among the Grey Mangroves those floods of 1893 and 1898 would cause a much greater number of fatalities. There is abundant evidence here that the 1893 flood deposited enormous quantities of silt along portions of the river which well may have wiped out the mangroves altogether at that time.

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NATIVE ANIMALS AND BIRDS PROTECTION ACT.

Members will learn with pleasure of the appointment of Mrs. W. M. Mayo as an Honorary Ranger under the above Act. Mrs. Mayo, who is Hon. Secretary of the Nature Lovers' League, has the honour of being the first woman ranger appointed. Amongst Mrs. Mayo's activities as Hon. Secretary of the Nature Lovers' League has been the placing of printed sanctuary notices in conspicuous places on the island sanctuaries of Moreton Bay, and in approaching the Royal Queensland Yacht Club with a request for their help in abating the shooting evil in the bay. Through her efforts weekly lectures before the trainees of the Teachers' Training College on natural history subjects have been arranged.

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The Queensland Naturalist.

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PROCEEDINGS.

EVENING MEETING, 25th JULY, 1928.—Mr. D. A. Herbert presided. Misses A. Dobbs and U. Twine and Messrs. T. Nicholls and E. C. Tommerup were elected members. Reports on the recent excursion to Aspley were given by Mr. J. O'Neil Brennan (birds), Dr. E. O. Marks (geology), and Mr. D. A. Herbert (botany). Mr. J. Nebe exhibited a number of photographs and stereoscopic views of some of the islands of the Great Barrier Reef.

The principal business of the meeting was a lecture by Mr. C. T. White, Government Botanist, on—

RECENT BOTANICAL WORK IN THE PACIFIC.

The lecturer dealt with the floras of New Guinea, New Caledonia, and the New Hebrides, to the botany of which countries he had paid a good deal of attention during recent years. New Guinea is politically divided into three territories, viz., Dutch New Guinea, Papua or British New Guinea, and the Mandated Territory. As regards the Dutch territory several large expeditions have been organised under the auspices of the Netherlands Government, the most important of these within recent years being the expedition of 1907, under Captain H. A. Lorentz, and 1912-13, under Captain Herderschee. The scientific results of these expeditions are contained in a large series of volumes published in Holland under the title of "Nova Guinea"; this series is still appearing dealing with recent expeditions. One of the most notable expeditions to the Dutch territory was the Wollaston expedition (British), of 1912, the object of which was to study the geography and natural resources of the Snow Mountains, and to ascend the highest peak, Mt. Carstenz, which rises to a height of 15,708 feet. Mr. C. Boden

Kloss was in charge of the botanical and zoological work. A visit productive of many novelties was that by the well-known lady botanist and explorer, Miss L. S. Gibbs, who ascended the Arfak Mountains in 1913.

As regards the Mandated Territory, it may be said that the Germans since their occupation of the country in 1884, carried out investigations into the flora with characteristic Teutonic thoroughness, and in 1901 published a large work on the Flora of the German possessions and protectorates in the south seas. A supplement to this work was issued in 1905. The authors were K. Schumann, a well known German botanist, and K. Lauterbach, a director of the German New Guinea Company. The latter had paid several visits to New Guinea, and made large collections, and is still editing a series issued from the Botanic Gardens, Berlin, entitled, "Contributions to the Flora of Papua"; the first of these appeared in 1912, and the latest (No. 14) last year. Since its occupation by Australia the only work done in the Territory of any consequence was that by Mr. C. E. Lane-Poole, who visited there in 1923-24, and reported on the forests and forest resources of the Territory.

As regards British New Guinea, known officially as the Territory of Papua, the lecturer stated he had visited the territory in 1918, and published an account of his findings in the Proceedings of the Royal Society of Queensland for 1922, giving as an introduction a history of botanical work in the territory. Since that date, collections named by Forbes in 1885 have been determined mainly by botanists at the British Museum, and a complete account of them given as a supplement to the "Journal of Botany" (England) for 1923. It seems a great pity that the collections made by this well-known geographer should have lain undetermined for so many years. Mr. C. E. Lane-Poole, Commonwealth Inspector-General of Forests, visited the territory in 1922-3, and made extensive collections. His general results, both on this territory and the mandated territory have appeared as a Parliamentary Report (Melbourne, 1925), while his new species have been described in the Proceedings of the Royal Society of Queensland by the lecturer and Mr. W. D. Francis.

In his general account of the forests of New Guinea, Mr. Lane-Poole divided the vegetation according to zones of altitude, and this is probably the best way to deal with the flora. The first of these zones, which may be called

lowland forests (0-1000 feet) consists of littoral forests, mangroves and beach trees of much the same species as in Australia and tropical Asia; savannah forests in which eucalypts predominated at least in the Territory of Papua, and rain-forests and jungles very similar to the vine scrubs of North Queensland, but with a more Malayan character. The foothill forests (1,000-5,500 feet) were mostly rain forests similar to those of Queensland, but true oaks (*Quercus*), and an undergrowth of Balsams (*Impatiens*) and Begonias represented plants not found in Australia. The mid-mountain forests (5,500-7,000 feet) might be termed the country of the conifers—*Araucaria*, *Agathis*, *Podocarpus*, *Dacrydium*, *Phyllocladus* and *Libocedrus* all being found here. The mossy forests (7,000-11,000 feet) were characterised by dwarf trees covered with mosses, filmy ferns, lichens, liverworts, and selaginellas. *Vaccinium* and *Rhododendron* were the two most characteristic genera. The highest zone, that of alpine forests and grassland, had been described on several occasions. The Wollaston expedition found a few *Rhododendrons* bushes up to nearly 13,000 feet; above this a daisy (*Myriactis*) and a few grasses were the only flowering plants; 14,200 feet was found to be the lower limit of perpetual snow and ice. The alpine grasslands and forests of the Owen Stanley Range had been described by Sir Wm. Macgregor.

The flora of New Caledonia was then briefly touched on. New Caledonia has remained since 1853 the chief French possession in the Pacific. It is the largest island in the Pacific exclusive of course of New Guinea and New Zealand. It has a length of 248 miles and an average width of 25-30 miles. It is very mountainous, but the mountains did not rise to any great height, the two highest peaks being Mt. Painie, 5,413 feet, and Mt. Humboldt, 5,316 feet. The flora of New Caledonia was noted on account of the extreme degree of endemism, and the high percentage of woody plants. Most interesting was its collection of conifers and taxads, two genera, *Callitropsis* and *Austrotaxus*, being confined to the island. The latter was especially interesting, as representing the only very near ally in the southern hemisphere of the Yews of the north. Various French, English, and German botanists had worked on the flora, the work of Frenchmen naturally predominating. The most recent work of any consequence was that of Compton, who spent practically the whole of 1914 in the country. The lecturer visited the island in 1923 on behalf of the Arnold Arbor-

etum of Harvard University. The nearest floral affinities seem to be with Australia, the two countries having several genera in common not found elsewhere.

The New Hebrides, the Solomons and the Santa Cruz groups were described as probably the least known parts of the Pacific botanically.

EVENING MEETING, 20th AUGUST, 1928.—Mr. D. A. Herbert presided. Mrs. E. B. von Steiglitz and Miss Stanford were elected members of the Club. The principal business of the meeting was a lecture by Mr. B. Dunstan, Government Geologist, on—

MOUNT ISA: ITS PHYSIOGRAPHY AND GEOLOGY.

Mr. Dunstan mentioned at the outset that he and his party found, when in the Templeton River area, near Mount Isa, countless numbers of trilobites (fossil crustaceans, belonging to the Palaeozoic period), and Professor Edgeworth David considered the fossilised evidence as belonging to this so-called pre-Cambrian period, that fixed the age fairly definitely of the Cloncurry series. If he was correct in defining the remains as fossil forms, it would mean that he had identified forms of life earlier than any other form of life in the world.

Mr. Dunstan also had something to say about the Mica Creek mica deposits, close to Mount Isa, and also about some very old geological formations to the west of Glenormiston, near the Northern Territory border. The coloured lantern slides used to illustrate the lecture depicted the condition at the Mount Isa mines, both above and below the surface, not the least interesting being a picture of some of the pioneer "gougers," and another of the spot where Campbell Miles, the discoverer of Mount Isa, hesitated whether to take the advice of his friends and leave the lead deposits alone, and go on to the copper lode, for which he was making, or peg out leases at the outcrop he had just discovered. Mount Isa, the lecturer explained, was named after Isabelle, a young niece of Campbell Miles, of Sydney.

Some interesting sections were also shown to illustrate the extraordinary size and values of the various Mount Isa lodes, one of which—the Black Star—had a width of 212ft. It was this latter deposit which was now being prospected with a diamond drill to determine the character of the lode at a depth greater than 1000ft. In one section of the Black Star ore beds, Mr. Dunstan said, he

counted 100 layers of strata to the inch. The material was as fine as a sheet of paper. Those layers must have been laid down under some very favourable conditions in the earth's history, and there must be miles of that class of country. What those conditions were was a problem the geologist wanted to solve. He would say that in all probability the silver-lead deposits of the Black Star lode went down to interminable depths. Whether there was a change in their mineral structure was, of course, another matter. He depicted, by means of the slides, a section of country bearing pre-Cambrian rocks between Templeton and Mount Isa, where, he said, there were five miles of strata that must have been in existence before our world (stratigraphically speaking) began, before anything we recognised in the way of life began. It represented a world they knew nothing about, because no forms of life that might have existed in that period had been preserved, so far as they knew. Reference was also made by Mr. Dunstan to the suitability of the Mount Isa lodes for geophysical research, because of their being interbedded with other rock masses so different from them in physical characters and electrical properties. In the tracing of the lodes along the surface geophysics would be particularly useful as the extension of the outcrops away from the main centre were marked by superficial coverings.

At the conclusion of the lecture a vote of thanks was moved by Dr. E. O. Marks, seconded by Mr. Heber A. Longman, and carried by acclamation.

SPECIAL MEETING, 7th SEPTEMBER, 1928.—Mr. D. A. Herbert presided. Mr. T. C. Roughley, Economic zoologist of the Technological Museum, Sydney, delivered a lecture on—

THE LIFE HISTORY, CULTIVATION, AND PESTS OF THE AUSTRALIAN OYSTER.

The lecture was attended also by members of the Yacht Club, and by many oyster growers and others interested in the industry commercially.

The story of an oyster's birth and the aimless wanderings of its childhood days was not only one of very great interest from a scientific standpoint, but a knowledge of it was also of very great value to the culturist, said Mr. Roughley. Until very recently the Australian rock oyster was regarded as being stable in regard to sex; in other words, it was born either a male or a female, and

remained so throughout life. He had recently discovered that at least one change of sex occurred in the life of every rock oyster. The great majority, if not all, functioned first as males, and later as females. Possibly a recurring change of sex occurred throughout life. An oyster might spawn when 12 months old, or even younger, and the female might eject upwards of a million eggs at each spawning period. The wastage that took place between the ejection of the eggs and the attachment of the oyster as spat was enormous, and it was well that it was so, for a calculation made by Professor Brooks, an American investigator, had shown that if all the eggs of oysters were to be fertilised, and were to live and grow to maturity, they would fill an entire bay in a single season, while the fifth generation of descendants from a single female would make more than eight worlds as large as the earth, even if each female spawned but once.

Within a few hours after fertilisation, the embryo oyster, a naked cluster of cells about one-five-hundredth of an inch in diameter, began to swim about. Within two days it developed shells, and then began to feed. During the whole of the first ten days of its existence it was swimming continually from the surface of the water to the bottom, and, although for its size it was a relatively strong swimmer, it was nevertheless carried hither and thither by currents, and was at the mercy of wind and tide. During the later stages of its larval life, the oyster developed a foot, by means of which it was able to crawl about and extricate itself from minute debris which would otherwise overwhelm it. Having indissolubly attached its shell to an object in the water, its swimming organ and foot were absorbed within a day or two, and the oyster could never again move about.

“Oyster cultivation in Queensland,” continued Mr Roughley, “has for the last 40 or 50 years been confined almost solely to the gathering of young oysters from areas where they grow but slowly and transferring them to beds, usually prepared by top-dressing heavily with dead shells, where a more rapid growth takes place. And this has for many years proved to be most wasteful of results. Oysters lying in contact with the bottom are at the mercy of numerous pests which frequently take toll of very large numbers. If the industry is to thrive, these pests must be combated, and this can readily be done by keeping the oysters off the bottom. The most efficient means of doing this is by the use of wire netting

racks or trays. This system of maturing oysters has developed enormously in New South Wales during recent years, and probably no better method of maturing has yet been devised.

The many pests which continually harass the oyster, concluded Mr. Roughley, included the mud worm, which collected heaps of mud inside the oyster's shells and eventually killed it; boring whelks or tingles, which, by means of a rasp-like tongue or radula, bored small, cylindrical holes through the shells, and then fed on the flesh; fish, such as the mullet, which consumed enormous numbers of swimming larvae; the bream, toadfish, and ray, which crushed the shells of oysters; crabs, which also crushed the shells between their powerful nippers, and many others. One of the most persistent and harassing pests, not only in Queensland, but also in New South Wales, was the human oyster thief. So prevalent, so exasperating, was the oyster thief to the culturist, that it was high time that severe steps were taken to crush him, and that would only be done by the infliction of much more severe penalties than had been customary in the past.

A vote of thanks to the lecturer was passed on the motion of Mr. H. A. Longman, seconded by Mr. Barber.

EVENING MEETING, 17th SEPTEMBER, 1928.—The president (Mr. J. E. Young) presided. Mrs. Baddiley, Miss Smith, and Miss Woolnough were elected members. Reports on recent excursions to Eight Mile Plains and Belmont respectively were given by Dr. E. O. Marks (geology), Mr. G. H. Barker (ornithology), and Messrs. J. E. Young and J. C. Smith (botany). Specimens of (1) an exceptionally large bacterial nodule from the root of a bean, and (2) a feather starfish were shown by Mr. J. H. Simmonds. Several interesting exhibits from the Great Barrier Reef were staged by the president (Mr. J. E. Young).

WILD FLOWER SHOW and GENERAL NATURAL HISTORY EXHIBITION, SATURDAY AFTERNOON and EVENING, 29th SEPTEMBER, 1928.—The exhibition was officially opened by the Governor (his Excellency Sir John Goodwin).

There was a very fine display of wild flowers from different parts of the State. Especially fine district exhibits were staged by Mr. Rudder (Springbrook), Mrs. E. S. Curtis and Mr. and Mrs. D. Curtis (Upper Albert River), Mr. Thos. Welsby and Miss Welsby (Stradbroke

Island), and Mr. and Mrs. Herbert Curtis (Tambourine Mountain).

Interstate exhibits were received from the Naturalists' clubs of West Australia, South Australia, and Victoria, and from Mr. J. F. Bailey (Adelaide) and Mr. H. J. Spencer (Williamstown).

Five entries were received from State Schools for competition—Caloundra, Lagoon Pocket, Bidwill, Withcott, and Thulimbah. Prizes were awarded to Lagoon Pocket, Withcott, and Thulimbah. The thanks of the Club are due to Mr. G. H. Barker for donating prizes.

Wild flowers were received from Mesdames Gittins, Glass, Bourke, and Heeschen (Granite Belt), Mesdames Cannon and Durbridge (Maroochydhore), Miss Watson (Howard), Miss Palmer (Caloundra), Mrs. Saltmarsh, Miss M. Birt, Mr. J. E. Young, and Mr. Campbell (South Coast), Mrs. Aubrey Thomson (Eight Mile Plains), Mr. C. T. White (Sunnybank), Mrs. Cöngeau (Bribie Island), Mr. E. W. Biek (native flowers from Botanie Gardens), and Mrs. Clark (Bird-flowers or Crotalaria, grown in Brisbane).

A very fine geological exhibit was displayed by the Queensland Geological Survey.

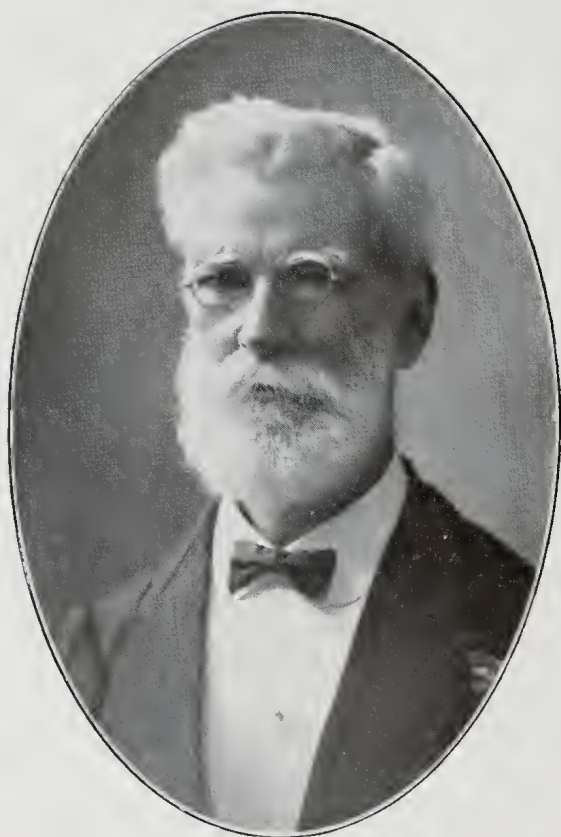
Natural History photographs were exhibited by Messrs. G. W. Gaukrodger, W. G. and R. C. Harvey (Mackay), Otho Webb, R. L. Higgins, E. F. Robinson, and Mrs. Herbert Curtis. A series of paintings and line drawings of wild flowers of the Brisbane district was staged by Mrs. Aubrey Thomson.

Entomological exhibits were shown by Mr. H. F. Mead (Waterford) and Mr. Densil Curtis (Upper Albert River).

Emu and cassowary eggs, laid by birds in captivity at the Brisbane Botanie Gardens were shown by Mr. E. W. Biek.

A particularly fine series of Queensland shells was staged by Mr. J. H. Simmonds, senr. Miscellaneous exhibits included bag of bag-moth by Mr. C. Dornbusch (Warwick), and large stick insect by Mr. J. C. Smith.

EVENING MEETING, 15th OCTOBER, 1928.—The president (Mr. J. E. Young) presided. Mr. H. G. Burdard read a paper on "The Birds of Cape York" (see p. 94), and Mr. John Nebe gave an account illustrated by lantern slides of a recent natural history expedition to the islands of the Bunker and Capricornian groups in the Great Barrier Reef (see p. 102).



The Late Mr. W. R. COLLEDGE

THE LATE MR. W. R. COLLEDGE.

By the death of William Robert Colledge on the 26th August, at the ripe age of 87 years, the Queensland Naturalists' Club has lost one of its keenest and ablest supporters. Mr. Colledge was born in the north of England, but had resided in Queensland the greater part of his life. In official life he was manager of the Brisbane Associated Friendly Societies' Dispensaries. He was intensely religious, a great supporter of the Methodist Church, and in his younger days used to do a great deal of lay preaching in the Brisbane and country churches.

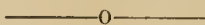
Mr. Colledge was one of the older type of naturalists interested in nature in a broad way, and to the study of natural history most of his leisure time was devoted. He was generally interested in microscopy more, specially in rotifers and other forms of pond-life, and in the life history of mosquitoes. On these subjects he was a well known authority, and published numerous papers in the "Proceedings of the Royal Society of Queensland," and in a more popular way in the "Queensland Naturalist."

Practically from its inception till within a few years of his death he was an ardent supporter of the Queensland Naturalists' Club, and rarely missed a meeting or excursion. His method of work was, after an excursion, to examine the material found and afterwards to fix, mount, photograph, and make lantern slides of the more interesting captures. It was always his aim to have a few fresh slides for every meeting. A number of his negatives have been handed over to the club as well as a set of his lantern slides, and it is hoped to be able to use these for Club work in the future.

A list of his writings in chronological order is given herewith:—

- 1900. "Observations on the Life History of the Common Mosquito"; Proc. Roy. Soc. Q'land, Vol. XV., pp. 111-131.
- 1901. "Notes on a Malaria-Carrying Mosquito (*Anopheles pictus*)"; Proc. Roy. Soc. Q'land, Vol. XVI., pp. 45-59.
- 1902. "Notes on a Species of Sandfly"; Proc. Roy. Soc. Q'land, Vol. XVII., pp. 17-24.
- 1904. "Notes on the 'Scots Gray' Mosquito"; Proc. Roy. Soc. Q'land, Vol. XVIII., pp. 67-80.
- 1907. "Notes on an Apparently New Species of Hyaline *Daphnia*"; Proc. Roy. Soc. Q'land, Vol. XX., pp. 53-60.

1911. "Notes on the Rotifers or Wheel Animalculae of Brisbane"; Proc. Roy. Soc. Q'land, Vol. XXIII., pp. 87-91.
1914. "Additions to the Rotifera of Queensland"; Proc. Roy. Soc. Q'land, Vol. XXVI., pp. 70-75.
1917. "Lophopus brisbanensis, sp. nov."; Proc. Roy. Soc. Q'land, XXIX., No. 10, pp. 123-124.
1918. "Notes on a New Rotifer—*Melicerta coloniensis*"; Proc. Roy. Soc. Q'land, Vol. XXX., No. 12, pp. 171-174.
1920. "An Interesting Copepod"; Queensland Naturalist, Vol. II., No. 4, pp. 105-106.
1921. "Water Bears, or Tardigrada"; Queensland Naturalist, Vol. III., No. 2, pp. 28-29.
1922. "A Wonderful Rotifer"; Queensland Naturalist, Vol. III., No. 3, pp. 50-51.
1922. "A Telescoping Rotifer"; Queensland Naturalist, Vol. III., No. 6, page 111.
1923. "Notes on Rotifers and Some of the Life in the Chelmer Swamp"; Queensland Naturalist, Vol. IV., No. 3, pp. 57-58.
1925. "A New Rotifer of the Melicertan Family"; Proc. Roy. Soc. Q'land, Vol. XXXVI., pp. 137-138.



BIRDS OF THE CAPE YORK REGION, NORTH QUEENSLAND.

By H. G. Barnard.

October being considered "bird month" in Queensland, I was asked to give a short paper on bird matters before members of the Queensland Naturalists' Club, and have decided to talk on some of the birds of the Cape York district. As some of you are probably not familiar with that part of Queensland, I think a short description of the country and conditions there, would not be out of place. Cape York, the most northern part of Australia, is a barren, rocky point, and separated from the mainland by a narrow channel, is a rocky island, on which stands a light house. The light is a revolving one and automatic. No one lives there, and it is only visited now and again by the light ship to replenish the fuel and to see that everything is in working order.

Ten miles down the west coast, is the Peak Point telegraph station, the most northern telegraph station in Australia. Ten miles east of Cape York and situated in Albany Pass, is "Somerset House." Albany Pass is, I consider, one of the most beautiful, if not the most beautiful, pass in Australia. On a scrubby hill near

Somerset, was the original settlement, before it was moved to the desolate spot known as Thursday Island. The moving of the settlement to Thursday Island was a very great mistake. Millions of tons of rock exist on either side of the pass, and by blocking the eastern end of the pass, one of the finest and most beautiful harbours in the world would have been made. Not only that, but settlement would have spread over the Cape and could have been reached by land as well as by water, whereas now Thursday Island can never be any good for settlement.

Albany Island forms one side of the pass, and on the mainland about the centre of the pass, Somerset House is built. For many years it was occupied by that great pioneer of the north, Mr. Frank Jardine, and his family. Frank Jardine and his wife now rest in a beautiful spot just above high water, in the pass that he loved so well.

The country, generally, consists of large tracts of scrub, or rain forest, with belts of open forest, which consist of several kinds of eucalypts and other trees, such as *Melaleuca* (tea-tree) and wattles (*Acacia*). There are no mountains, but some of the hills are fairly high and very rough.

There are only two seasons in that part—the south-east and north-west. From April to November the wind blows steadily day and night from the south-east. During this period very little rain falls, and most of the waters dry up. Then towards the end of November or beginning of December the wind veers to the north-west. Thunderstorms occur, and are followed by heavy rains, which continue till the end of March. Dry creeks become raging torrents, swamps are filled; the scrubs teem with insect and bird life, and in the open parts, the grass, which has all been burnt off, grows rapidly till it is almost impossible to walk through it. Trees and shrubs are laden with bloom, and in the scrubs acres of lilies and ground orchids bloom, a veritable Garden of Eden, and the serpents are there, too. Numbers of them, large and small, many grow to 20 feet and over in length.

Now we must get on to the birds. If you were on Cape York during the so-called winter months (for there is really no winter, the thermometer rarely going below 60 deg.), you would be struck by the seeming absence of bird life, because in the dark scrubs or rain forests the birds are very silent and are seldom seen. But as winter gives place to spring, the scrubs awake to life; especially is this so in the early morn, when one wakes to hear the

drumming of the emu, the cackling of the megapode or scrub hen, the clear whistle of the rifle bird, the cooing of numerous fruit pigeons, the shrill whistling notes of the great palm cockatoo, and a host of other birds.

As spring advances, so the number of birds increase, their ranks being augmented by the thousands of migrants from New Guinea and adjacent islands. If you were on the extreme northern point of Cape York, you would see all day long, and day after day for weeks, birds passing to the mainland. Many arrive singly, or in twos and threes; others in flocks of from 15 or 20 to a hundred or more; some of them skim the surface of the sea, and many perish through getting their feathers wet. Others fly high, almost out of sight. Not only during the day does this migration take place, but also at night. Such birds as the Roller or Dollar-bird, Pittas, Kingfishers, and Mopokes cross at night. Probably on account of being poor flyers, they cross at night to escape hawks. Many of these migrants remain on Cape York to nest, others continue their flight south, some even reaching Victoria. After the nesting is over, most of the visitors return to the islands, though, at times some of them remain with us during the winter. These are probably late broods, or old birds that do not feel equal to the return journey.

I am sorry to say that during a recent visit to the North, I was informed on good authority that the number of birds has greatly decreased of late years, especially so in the case of the beautiful Straits, or Nutmeg pigeons (*Myristicivora spilorrhoa*). At one time these birds came over from New Guinea in hundreds of thousands, most of them returning to the islands along the coast from Cooktown to Roekingham Bay to breed. I have seen every tree and bush on some of the islands covered with their nests, some even building on the rocks and among the ferns, only a single egg is laid. The black butcher birds are great robbers of the pigeons' nests, waiting their chance when the pigeon leaves the nest for a short while, to seize the egg or young.

During the day the male pigeons repair to the mainland to feed on the wild fruits, returning to the islands in the evening to feed their brooding mates.

Tremendous toll was taken by pot hunters, and as population increased in the North so the slaughter increased, and thousands of young birds died in the nests. For some years these pigeons have been on the totally

protected list. This, however, does not mean the slaughter has ceased, and they are fast nearing the point of extinction.

I will now say a few words on the nesting habits of some of the birds. First on the list come the beautiful rifle birds. These birds really belong to the Paradise family. In Australia we have three Rifle birds. Most of you are familiar with the bird of the southern parts, at least in the scrubs. A smaller one, the Victoria Rifle bird, is found from north of Townsville to Cooktown, and a larger one on Cape York. For a long while the eggs of these birds were much sought after by collectors, and a set of eggs from the Cairns district were described by Mr. A. J. Campbell as belonging to the Victoria Rifle bird. This, however, was proved wrong.

In 1892 the late Mr. Dudley Le Souef and myself landed on one of the Barnard Islands, where we spent a week, and were fortunate in finding a nest with a single egg. This, the type egg, is now in the Australian Museum, Sydney. The nest was a very loosely built structure, composed of large dead leaves, lined with a few vine tendrils, and draped with the shed skin of a snake. It was placed in the top of a Screw Palm, or Pandanus. This placing the shed skin of a snake round the nest is a feature peculiar to the Victoria and Southern Rifle birds. The Albert Rifle bird of Cape York does not use these decorations. Four years after finding the egg of the Victoria Rifle bird, in 1896, while wandering in the scrubs of Cape York, I came across a nest built in the top of a small palm about 6 feet from the ground, and on placing my hand in the nest, lifted out a beautiful pair of eggs, which I at once recognised as belonging to a Rifle bird. While waiting for the return of the parent bird, to be quite sure of its identity, I heard a rustle in the leaves behind me, and turning round saw a small 'goanna,' or Gould's Monitor, holding a very large centipede by the head. For a while the "goanna" watched me, while the centipede crawled round its head in a vain endeavour to escape. With a sudden gulp the centipede disappeared, and I will leave to your imagination what that monitor felt like inside.

The following year the eggs of the Southern Rifle bird were taken on the Richmond River, and so the nesting habits of the three Rifle birds were known. The note of the Cape York bird is a loud, clear whistle, repeated three times.

Manucode (*Phonygammus keraudrenii*).—This is another of the Paradise family, and is the only representative of the Manucodes in Australia, though New Guinea has several, one very beautiful member of the family being found on Ferguson Island, off the east coast of New Guinea. These birds have a very curious formation of the windpipe, which continues just under the skin to the lower end of the breast bone, where it is curled round and round like a piece of rope, finally returning under the skin and entering the body at the base of the neck. I do not think this has anything to do with the call, as the note is short and harsh, except in the case of the Ferguson Island bird, which has a long trumpeting call. I was fortunate in discovering a nest and eggs of the Manucode on Cape York in 1896, also in finding a peculiar trait in the nesting habits.

Most birds shun the company of butcher birds, on account of their murderous instincts, and the black butcher bird (*Cracticus Quoyi*), of northern parts, live well up to their reputation." However, the Manucode, "a very shy bird, mostly found in the tops of the tallest scrub trees, and a fruit eater," cultivates the company of the black butcher bird, especially at nesting time, building in the same or an adjoining tree. The Manucode does not start building till some time after the butcher bird, so the butcher birds generally have eggs first. If these are taken the Manucodes at once desert their nest and follow the butcher birds to a fresh nesting site. This is probably done for protection, as both are black birds. I have seen a white cockatoo unwittingly approach a black butcher bird's nest, and being attacked by both birds, driven to the ground and given a bad time till I interfered on cocky's behalf.

Palm Cockatoo (*Microglossus aterrimus*).—This is one of, if not our most interesting cockatoo. Black, with a large red patch of skin on the sides of the head, a black crest, like the feathered headdress of an Indian chief, and a loud whistling call, it at once attracts attention. The food consists of the kernels of large nuts growing in the scrubs, the hardest of which are easily cracked open with the powerful beak. As these nuts are plentiful during the wet season, the birds nest at that time.

Being a large bird, they select a large upright hollow from three to six feet in depth. One would imagine that the heavy rain pouring down the hollow would de-

stroy the single egg, or drown the young bird. But Nature does not make mistakes of this kind, and has endowed the birds with brains or instinct to overcome the difficulty. The only suitable breeding hollows are to be found in the large Bloodwood (*Eucalyptus*) or *Melaleuca* trees growing in forest country. In preparing the nesting hollow, the birds repair to the nearest scrub, in some instances from half a mile to a mile away. Here they select a straight bough about eighteen inches in length by one inch in diameter. This is soon cut through with their powerful beaks. Then holding the stick near the centre, with the beak, they fly to the hollow, and drop the stick inside; then climb down and reduce it to splinters from three to six inches in length. The performance is repeated till a platform is raised from six to eight inches high. On this the egg is laid, and so the egg and young bird are kept off the wet bottom of the hollow. The reason the birds select "scrub" timber is on account of it being much softer and more easily reduced to splinters than the hardwoods of the forest.

You all probably know that pest, the introduced starling. Well, we also have a starling in Queensland, and a far more interesting one than the introduced bird. This bird (*Calornis metallica*), also known as the weaver bird, crosses from New Guinea during the months of September and October, and spreads over the whole of the scrubs of northern Queensland. The birds congregate in flocks of many hundreds, and have a habit of rising in the air like a cloud, then whirling with incredible speed, dash through the tree tops; and yet I have never seen a single bird injured while doing so. How they escape colliding with each other and the trees is a marvel. In nesting they select a large tree, either in scrub or forest, and construct their nests of vine tendrils woven and matted together in great bunches. So great does the weight become, the branches often break, and many eggs broken and young birds killed. I have counted as many as three hundred nests in a single tree. Their food consists chiefly of berries, and it shows how bountiful Nature is, when the scrubs can produce sufficient to keep such enormous numbers of birds in food. When nesting they are very noisy, and one can easily locate a nesting tree by the noise. Care should be taken not to stand under a nesting tree, as these birds become grossly infested by a minute red parasite commonly known as "scrub itch," and anyone standing under a nesting tree is in for a bad

time afterwards. On completion of nesting the birds return whence they came.

Fawn-breasted Bower bird (*Chlamydera cerviniventris*).—This is a coastal bird and inhabits the black tea-tree country. It does not go inland. It is distinguished from the spotted and great Bower birds, by having no lilac patch on the nape of the neck. The bower resembles those of the spotted and great Bower birds, but is small and does not contain shells. It has, however, green and red berries and red flowers. I tried placing bits of blue ribbon in one bower, but the birds would have none of it, and as often as I put the bits in the bower, would take them out and drop them ten or fifteen feet away. I got tired of the game first. The nest and eggs are similar to those of the other bower birds.

Great Bower bird (*Chlamydera nuchalis*).—This, the largest of the Bower birds, keeps more to inland parts, though it does at times visit the coast. They are very fond of shells for the bower, especially small sea shells, and I have seen numbers of them in bowers fully four miles from the sea, showing the birds go long distances to obtain suitable toys. The nest and egg are similar to the fawn-breasted bird, but it is only on very rare occasions more than one egg is laid.

There are two kinds of Dragoon birds, or Pittas, on Cape York—*Pitta simillima* and *Pitta maeklotii*. As both have the same habits, I am taking them together. *Pitta simillima* resembles our southern bird, while *Pitta maeklotii* is known as the blue-breasted Pitta. They build bulky stick nests at the foot of a tree, and lay from three to four eggs. Both birds migrate to New Guinea and adjacent islands. If you were working the scrubs in September and October, you would probably not see or hear a single Pitta. Then one morning early in November you will enter the scrub and be greeted with the notes of two strange birds. These notes seem to come from every direction, and for some while you find it hard to locate the birds; then, happening to look in a tree, you will see a Pitta standing on a thick bough, looking very tired. On looking round you will observe quite a number of them—both kinds. They evidently arrive during the night and light on the trees till rested, afterwards taking to the ground. Though essentially a ground bird, Pittas roost in trees, where I have frequently seen them, when working the scrubs for insects at night with a light.

When in the scrubs at night with your lamp you will often come across what appears at first glance to be a ball of fluff or wool. On looking closer you make it out to be a bird. The feathers are puffed out all round, so that the head and tail are completely hidden. The birds appear to be sound asleep, and you can place your hand over them and lift them off their perch before they move. The habit of puffing out the feathers is evidently a protection against snakes, as a snake attempting to take hold of a bird in this position would only get a mouthful of feathers.

A very beautiful bird is the silver-tailed kingfisher (*Tanysiptera sylvia*). This bird is also a migrant, and was supposed to cross from New Guinea, but the late Mr. A. J. North, of Sydney, once informed me it had never been found in New Guinea. Probably it comes from the Dutch portion. It is a day bird, yet it crosses at night. I was told by men of the pearling boats, that the birds often come to the lights on the boats, a proof they cross at night. They cross to Queensland in November, and at once get to work tunnelling into the small termites' mounds that are found on the ground all through the northern scrubs. During nesting operations the beautiful tail feathers get broken off, but are replaced at the next moult.

Red-necked Rail (*Rallina tricolor*).—This is a scrub bird and is never found in the open. For a long while there was a lot of confusion over the eggs of this rail, as nests with pure white eggs and others with spotted eggs were found, and both were supposed to belong to this rail. The late Mr. Kendal Broadbent, who did a lot of collecting in northern parts for the Queensland Museum, was of the opinion the eggs belonged to different birds. This proved to be correct. In 1911 Mr. W. McLennan, who was collecting for Dr. W. McGillivray of Broken Hill, and myself, who was collecting for the great bird man, the late Mr. H. L. White, of Belltrees, New South Wales, were able to solve the problem. Mr. McLennan found a nest containing spotted eggs, and secured the bird. This proved to be the Rufous-tailed Moor Hen.

A NATURALIST'S HOLIDAY ON THE GREAT BARRIER REEF.

By John Nebe.

It is well known that there is a great Barrier Reef almost the whole length of the Queensland coast, which formation is of coral. To most people this formation, its marine life, and beauty are not known. Indeed a person must see for himself before he can realise such wonderful display of Nature. The southern portions of the Great Barrier Reef are the Bunker Group, which consists of Lady Musgrave Island, Fairfax Island and Hoskyn Island, and is about sixty miles (60) miles east of Bundaberg. Further northward are the Capricorn Group, the most important islands of which are North-west Island, Heron Island, and Masthead Island. There are many more small islands as well as reefs, which only show above the water at low tide. Each island is surrounded with a reef which is in most cases very extensive. These groups of islands and reefs extend for 100 miles. I was fortunate in being a member of a nature study party last November and December, and the experience gained on such a perfect holiday will be remembered for all time. The few weeks passed much too quickly, and I am looking forward to spending another holiday at such a good and healthy spot. The party I became attached to was arranged in the south; many came from various States, and it was surprising that only a few Queenslanders took part in it. The southernmost portion of the Barrier Reef, consisting of the above islands, can be visited with reasonable expense.

The summer months represent the best time to study bird life there, as numerous sea birds then make these islands their nesting places; the turtles are laying their eggs at this time of the year. Fishing is not good in the summer, and was somewhat disappointing.

Lady Musgrave Island has an area of about 40 acres. It is one of the best islands for observation of Noddy Terns, a bird the size of a pigeon, black in colour with a white capped head. The trees are literally swarming with these birds. The trees are rather stunted on this island, as compared with some other islands in the same group; no undergrowth exists on the whole island, being long ago eaten off by the numerous goats which inhabit this place. By all appearances there is nothing to eat and drink for the goats, and yet they number about three



Gannet sitting on nest, Fairfax Island



Gannet (mother and young), Hoskyn Island

[Photos by J. NEBE.]

hundred. A very extensive lagoon affords shelter from the rough seas, and a very narrow passage is the only deep entrance into the lagoon; this is not easily found at dark or on a rainy day, and special care is needed by the navigators. Inside this great lagoon a dingey is very handy, and many a half day can be spent rowing among the coral pools which are gleaming with colour and life. By means of a glass bottomed bucket, which I took with me, we were able to look into the deep and see the most interesting and beautiful things, fishes swimming about and darting in and out of the coral in such natural and delightful surroundings that cannot be described better than a paradise of marine life.

Anyone visiting Lady Musgrave Island and the Lagoon is advised to provide himself with a glass-bottom bucket, which might be called a "Marineoscope." There are many different kinds of coral, different in shape and colour, some hard and brittle, others soft as weeds. Coral does not live and grow above low water mark; at this height it forms a levelled surface. Many pieces of coral get torn loose by the waves and roll on top of the otherwise even surface; some of these are of enormous size, and are called "niggerheads"; these projecting pieces are rough and hard, and as they cannot be seen at full tide, are dangerous to motor boats. By turning over these boulders of dead coral, many living things will be noticed, in particular a great variety of crabs, and occasionally a "Long Tom" or a "Coral Shark" darts out. One drawback to visitors to Lady Musgrave Island is that there is no drinking water. This has to be brought from Bundaberg, and on account of shortage we could not stay there as long as we would have liked.

Hoskyn Island was visited from Lady Musgrave Island, and is in reality three islands separated by about a mile of reef, which at low tide is dry, but the nature of the coral is brittle, and very hard to walk on. The northern section of this island is entirely a rookery for the Gannet. The Gannet is a large brown bird, with a white belly (not unlike a white apron). These birds nest on the ground and seem to lay only one egg at a season. At the time of our visit most of the young ones were hatched, some just out of the shell, while others looked like full grown birds; in fact, some as large as the parent, but their wings had not developed, and they were still covered in pure white down. Wherever a person looks a mother bird and its young can be seen. The mother

birds seem very proud of their young ones, and look very contented with their big chicks. When the young ones are small the mother runs away when a stranger approaches them, and deserts its young, but as the young birds grow older the parent exhibits no fear, in fact, it becomes quite tame. I have approached them with my camera within five feet and could have got even nearer. The male bird, who by the way, provides the food for the mother and young, is not so tame, but rather shy. Strange to say in this particular part of the island no other birds could be seen. The next day we noticed a large number of Gannets on Fairfax Island, but here there were also many White-capped Noddies, Sea Gulls, and other birds.

It is of interest that on each island there exists one pair of Sea Eagles. This is invariably the case, except North-west Island, where there are about three pairs. North-west Island is the largest in the group, and contains about three hundred acres. We stayed there for most of our time; plenty of fresh water can be had from the turtle factory, and many and varied are the points of interest. The reef itself is very extensive, very rough and treacherous to walk on; nevertheless fine shells and marine specimens are in abundance; wonderful coral pools on the edges of deep water, luxuriantly coloured and camouflaged to suit the surroundings. This island is about 100 miles north of Lady Musgrave, and it seems that the tropical climate improves the already glorified conditions. Also the vegetation on the island is much more abundant. The island is heavily timbered with *Pisonia*, attaining a height of 50 to 60 feet. The bird life is indeed magnificent; countless numbers of Terns and Mutton birds make this their abode, at least at that time of the year. In the evening before sunset wanderers start to come home, and until it is too dark to see them they still come, and the sky is almost black with birds.

The Noddies are day birds and are resting at night; not so with the Mutton bird, which seems to require no rest at all. After being far out at sea in the day, they return to the islands when it is getting dark, or even later, unable to land among the trees and bushes, they just fly to the shore and run along among the trees and bushes to a place they select for nesting. This is done in the ground by making great burrows 4 to 5 feet long, and 12in. to 18in. deep, the roots of the *Pisonia* trees and other shrubs keeping the sand from falling in. These burrows are all over the three hundred acres of the island,



Crested Terns, north-western side of Masthead Island



White-Capped Noddies, Lady Musgrave Island

[Photos by J. NEBE.]

and it can be imagined that it is no easy task for these birds to look up their quarters. Having found it there is no rest; some are scratching, others are fighting; all the birds are continually moving about and making weird noises, not actually imitating, but able to make all kinds of noises including cries like children, which gets on one's nerves, and you feel as if you would like to curse these birds, especially when you are obliged to pitch camp near them. Annoying as their noises may be, still there is something that instils love in you towards the Mutton bird. Their extreme tameness is marvellous; you may catch the birds quite easily if you wish, whether it is dark in your tent or whether a lantern is burning, the birds keep coming in and marching up and down. This goes on all the night till half-past three or four in the morning, when the whole flock of them start out for sea. In coming home at night they take their time, but in the morning there is a great hurry, and it can be imagined if many hundred thousands are making their way to the beach from all over the inner parts of the island, regular walks of about three feet wide are made by the birds, which act as outlets, and for half an hour these tracks, which number at least one hundred, are a busy scene, many get trampled on in this great rush to the sea. After 4 o'clock in the morning there is peace again on the island, and if the tourist is overtired he may enjoy a few hours sleep. This bird is rightly called the "Mystery Bird." They seem to have no sleep during the night and spend the day on the wing, returning home late to renew their activities on land for the coming night. Comparatively little is known of the habits of the Mutton bird. The young ones when hatched are given a feed of oil by the parents, and stay in the ground until ready to fly, when on a certain night every young bird will come out of its burrow and collectively they fly away, but where to, no one knows. The young bird has never before seen daylight, and certainly has not tried its wings, it did not in anyway provide itself with food, but just existed on the oil the parents gave it, yet it is able to fly to distant lands and look after itself.

On North-West Island a turtle industry is in operation. The canning factory where turtle soup is made, and other by-products is only small, nevertheless quite up-to-date. The turtle season only lasts three to four months of the year, perhaps just as well from a naturalist's point of view, for it can quite easily be imagined what would happen if a reckless and wholesale slaughter-

ing of the female turtle took place, even for a few years only. The female turtle comes out of the water about three times a year, at intervals of a month, to lay her eggs, and it is on such occasions that they are captured for slaughter. It is said that the male turtle is no good for soup, but such is not the case; it is simply that the males stay in the water, and it is by no means easy to catch them. The turtles are not as stupid as they may appear to most of us; at any rate they know full well that they have an enemy, namely, the turtle boys, on certain islands. On North-west Island no turtle will ever show itself on land until it is quite dark, whereas on other islands where they are not killed, many turtles can be seen on land late in the morning, and early in the evening, and they show no sign of fear. From this I conclude that each turtle selects its particular island every time it lays its eggs, and in all probability it is the same island, where it was hatched. A turtle lays between three hundred and four hundred eggs at a season, but probably only 1 per cent. survive to become full grown turtles. At least 50 per cent. of the young turtles as they come out of the ground and run to the sea are gobbled up by sea birds, and the number that reach the water are further greatly reduced by numerous sharks and other enemies.

Heron Island, which is twenty miles south of North-west Island, has an area of about 50 acres, and is a most central place in this group, and very suitable for camping. Many of the surrounding islands can be visited during a day, returning again for the night. Heron Island was the only place where Reef Herons were seen; these birds were also nesting; the place generally selected is between forks of trees about 20 feet from the ground. The nest is in most cases very openly constructed of old brushwood. Some young birds were also seen. These birds are rather shy, which is a contrast to all other bird life on the islands. On this island there were about half a dozen magpies, the same species as we have on the mainland, and quite a lot of Kingfishers.

Just to the south of Heron Island, with only a narrow deep water passage and the imaginary line of the Tropic of Capricorn between, a very extensive reef called the Wistari, can be seen at low tide, about ten miles in length, and covered at high water.

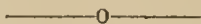
Masthead Island was visited from Heron Island. The tide was not altogether favourable and our stay on this island was only a few hours. When we were approaching

this island we could see an enormous number of Crested Terns flying about the shore. The tide was low, and we had to walk over half a mile of the worst formation of coral reef we ever struck, but it was worth while. We came to a place where the Crested Terns were nesting, about an acre of ground on the level, above high water mark. The sand was literally covered with birds and eggs. So close were they that one of our party measured off 84 square feet, and counting the eggs in this area made it 64. These birds appear white and are about the size of a wild duck. The eggs are very large for the size of the birds; only one egg is laid and hatched at a time. The reason why the birds gather so closely is for protection from Sea Gulls. We did not disturb the birds more than we could help, and even then many a Sea Gull made use of the opportunity and had a feed on the Terns' eggs. The Crested Terns have to stay on the nest, which is only a place in the sand from the time the egg is laid, until the young one can look after itself. The male bird is bringing in food in the meantime, an almost invariable habit with all the various kinds of sea birds on the islands, and a great swarm of male birds can always be seen carrying out their duties. This is by no means an easy task, for when these birds come home with a fish or other food for mother and young, a pirating bird that lives on robbery alone is awaiting. This robber, the Frigate bird, is continually hovering over the shores and the breeding grounds of the sea birds, and on this island above the Crested Terns' nesting places were seen seventeen of these big robbers. The Frigate bird seems to be able to keep up in the air without any effort, from early morning till late at night, when the stars are shining, always looking out to sea waiting for a bird coming in with a fish in its gullet, when at once it sweeps down upon it, and to avoid a struggle, the homing bird either swallows the fish intended for his mate, or gives it up to the robber.

There are no snakes, frogs, monitors, or even lizards on the islands. Insect life is very scarce, and no flies or mosquitoes are present, only a few spiders and grasshoppers were seen; centipedes are in great numbers. On North-west Island quite a number of domestic fowls gone wild are running in the bushes. These are believed to have got there from a boat, which was wrecked on the island 40 years ago. We tried to catch some of the chickens, but without result, the mutton bird holes and the undergrowth giving them ample protection. On Heron

Island, where white men have established industries, they have also introduced such undesirable creatures as cats, rats, and cockroaches, which in years to come may become a pest and a menace to the natural life, which these islands are gifted with.

The vegetation was more or less the same in character on all the islands visited; *Pandanus* palms, *Pisonia* trees, and two species of Fig trees are growing in abundance in the centre. As a shelter and protection from heavy winds the *Coast Casuarina*, *Tournefortia argentea*, *Cordia* and *Scaevola Koenigii* are growing on the sides. On most of the islands there is a lot of undergrowth, which consists to a large extent of *Abutilon muticum*, and several species of *Ipomaea*. Wilson Island is an exception to the above rule, the whole area, about 12 acres, being covered with *Pandanus* palms.



AN ENTOMOLOGICAL COLLECTION.

Members will learn with regret of the death recently of Mr. S. Hainsworth, a local entomologist, who some years ago took a considerable interest in the work of the Queensland Naturalists' Club. Mr. Hainsworth was a general collector, but was more especially interested in frog-hoppers. He has left a collection of insects, of which the following is a summary:—12 boxes of *Lepidoptera* (153 species), 1 box frog-hoppers (25 species), 1 box *Cicadidae* (7 species), and 3 boxes of miscellaneous insects.

The collection is in the hands of Miss Hainsworth, Buckle Street, Northgate, Brisbane, who wishes to dispose of it in its entirety, and would be glad to give further particulars to anyone interested.